ENVIRONMENTAL ASSESSMENT

Reducing Bird Damage
through an
Integrated Wildlife Damage Management Program
in the
State of New Jersey

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WILDLIFE SERVICES

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SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) proposes to continue the current damage management program that responds to bird damage in the State of New Jersey. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce bird damage to property, agricultural resources (including livestock), natural resources, and human/public health and safety. Damage management would be conducted on public and private property in New Jersey when the resource owner (property owner) or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed as humanely as possible using: shooting, trapping, and registered pesticides and other products. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or could include instances where application of lethal methods alone would be the most appropriate strategy.

ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BDM	Bird Damage Management
CBC	Christmas Bird Count
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NJAES	New Jersey Agricultural Experiment Station
NJDA	New Jersey Department of Agriculture
NJDEP	New Jersey Department of Environmental Protection
NJDFW	New Jersey Division of Fish and Wildlife
NJDH	New Jersey Department of Health and Senior Services
NJPCP	New Jersey Pesticide Control Program
RSU	Rutgers, The State University of New Jersey
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
TGE	Transmissible Gastroenteritis
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services

NOTE: On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The phrases Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this Environmental Assessment.

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

Across the United States, wildlife habitat has been substantially changed as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human/wildlife interactions. In addition, segments of the public desire protection for all wildlife; this protection can create localized conflicts between human and wildlife activities. The *Animal Damage Control Programmatic Final Environmental Impact Statement* (EIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way United States Department of Agriculture (USDA) 1997}:

> "*Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife is generally regarded as providing economic, recreational and aesthetic benefits . . . and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and value is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well.*"

Wildlife damage management is the science of reducing damage or other problems associated with wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 1990). The USDA, Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program (formerly known as Animal Damage Control) uses an Integrated Wildlife Damage Management (IWDM) approach, known as Integrated Pest Management (WS Directive 2.105[1]), in which a combination of methods may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 1:1-7 of USDA (1997). These methods may include alteration of cultural practices and habitat and behavioral modification to prevent or reduce damage. The reduction of wildlife damage may also require that local populations be reduced through lethal means.

This environmental assessment (EA) documents the analysis of the potential environmental effects of a proposed bird damage management (BDM) program. This analysis relies on data contained in published documents (Appendix A), including the *Animal Damage Control Program Final Environmental Impact Statement* (USDA 1997). The final environmental impact statement (USDA 1997) may be obtained by contacting the USDA, APHIS, WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

WS is the federal agency directed by law and authorized to protect American resources from damage associated with wildlife (Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat. 1549 (Sec 767). To fulfill this Congressional direction, WS activities are conducted to prevent or reduce wildlife damage caused to agricultural, industrial and natural resources; property; livestock; and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, private organizations, and individuals. Therefore,

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[1] WS Policy Manual - Provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Appendix.

wildlife damage management is not based on punishing offending animals but as one means of reducing damage and is used as part of the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action is derived from the specific threats to resources or the public.

Normally, according to the APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions may be categorically excluded {7 CFR 372.5(c), 60 Fed. Reg. 6,000 -6,003, (1995)}. WS has decided in this case to prepare this EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts from the proposed and planned damage management program. All wildlife damage management that would take place in New Jersey would be undertaken according to relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA). Notice of the availability of this document will be published in newspapers, consistent with the agency's NEPA procedures.

WS is a cooperatively funded, service-oriented program that receives requests for assistance from private and public entities, including other governmental agencies. Before any wildlife damage management is conducted, Cooperative Agreements, Agreements for Control or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to reduce wildlife damage effectively and efficiently according to applicable federal, state and local laws and Memorandums of Understanding (MOUs) between WS and other agencies. WS's mission, developed through its strategic planning process, is

1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and*

2) to safeguard public health and safety."

WS's Policy Manual reflects this mission and provides guidance for engaging in wildlife damage management through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1989)

1.1 AUTHORITY AND COMPLIANCE

1.1.1 Wildlife Services Legislative Authority

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the Wildlife Services program is the Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat. 1549 (Sec 767), which provides that:

> *"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program.*

The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."

Since 1931, with changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing "bringing (damage) under control", rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative directive and authority of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

1.1.2 New Jersey Department of Agriculture (NJDA)

The NJDA currently has a MOU with WS, which establishes a cooperative relationship between WS and the NJDA, and outlines roles and responsibilities for resolving wildlife damage management situations in New Jersey. The mission of the NJDA is to develop, promote, conserve, and support the agriculture and agribusiness industry of the state and those natural and renewable resources that are associated with agriculture and other open lands for the benefit of all its citizens. NJDA provides agricultural information and statistics to WS, forwards citizen's requests for wildlife damage management assistance to WS, and communicates wildlife damage management information to NJ's agricultural community.

1.1.3 New Jersey Department of Environmental Protection, Division of Fish and Wildlife (NJDFW)

The NJDFW currently has an MOU with WS, which establishes a cooperative relationship between WS and the NJDFW, and outlines roles and responsibilities for resolving wildlife damage management situations in New Jersey. The mission of the NJDFW is to protect and manage the State's fish and wildlife to maximize their long-term biological, recreational, and economic values for all New Jerseyans. The NJDFW Wildlife Control Unit (WCU) handles wildlife damage management problems and programs involving resident game and furbearer species, as well as resident game birds such as wild turkey. The NJDFW forwards citizens' request for migratory bird damage management to WS. The WCU cosigns Federal depredation permits that authorize take of migratory game birds. WS and the NJDFW WCU cooperatively assist NJ airports with wildlife hazard management issues related to mammals, such as white-tailed deer. The NJDFW Waterfowl Ecology and Management Program conducts research and management of waterfowl species, including Canada geese, mute swans, tundra swans, snow geese, mallards, black ducks, and others. The NJDFW Endangered and Nongame Species Program (ENSP) administers programs related to nongame birds such as vultures and gulls, and conducts management and education programs for endangered, threatened, and nongame wildlife species in NJ.

1.1.4 New Jersey Department of Environmental Protection, Pesticide Control Program

The NJDEP Pesticide Control Program (PCP) enforces state laws pertaining to the use and application of pesticides, including those related to the registration of pesticide products, licensing of private and commercial pesticide applicators, and licensing of pesticide businesses. The PCP implements regulations found in N.J.A.C. Title 7 Chapter 30, Subchapters 1-12. Pesticide products for bird damage control are registered through the PCP by USDA APHIS WS and other entities (eg. pesticide manufacturers).

1.1.5 New Jersey Department of Health and Senior Services

The NJDHSS currently has an MOU with WS, which establishes a cooperative relationship between WS and the NJDHSS, and outlines roles and responsibilities for resolving wildlife damage management situations in New Jersey. The NJDHSS provides technical guidance to WS on public health related issues and potential health problems associated with wildlife, and refers callers with wildlife damage related questions to WS.

1.1.6 New Jersey Agricultural Experiment Station, Cook College, Rutgers, The State University

The New Jersey Agricultural Experiment Station (NJAES), Cook College, Rutgers, The State University (RSU) currently has an MOU with WS, which establishes a cooperative relationship between WS and the NJAES, and outlines roles and responsibilities for resolving wildlife damage management situations in New Jersey. NJAES RSU provides educational, outreach, and extension information to citizens, and provides educational sessions and courses on wildlife issues.

1.1.7 U.S. Fish and Wildlife Service (USFWS)

The USFWS is responsible for managing and regulating take of bird species that are listed as migratory under the Migratory Bird Treaty Act (MBTA) and those that are listed as threatened or endangered under the ESA. In NJ, the USFWS administers five National Wildlife Refuges (E.B. Forsythe, Cape May, Great Swamp, Wallkill River and Supawna Meadows NWR's), two Law Enforcement Offices (in Elizabeth and Pleasantville, NJ), and an Ecological Services Field Office (Pleasantville, NJ).

The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

"From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President."

The authority of the Secretary of Agriculture, with respect to the Migratory Bird Treaty, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

CFR 50 Subchapter C - The National Wildlife Refuge System - Part 30 - Feral Animals - Subpart B-30.11 - Control of feral animals states: (a) Feral animals, including horses, burros, cattle, swine, sheep, goats, reindeer, dogs, and cats, without ownership that have reverted to the wild from a domestic state may be taken by authorized federal or state personnel or by private persons operating under permit in accordance with applicable provisions of federal or state law or regulation.

1.1.8 Compliance with Federal and State Statutes

Several federal laws, state laws, and state regulations regulate WS wildlife damage management. WS complies with these laws and regulations, and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act. Environmental documents pursuant to NEPA must be completed before operational activities consistent with the NEPA decision can be implemented. This EA meets the NEPA requirement for the proposed action in New Jersey. When WS direct management assistance is requested by another federal agency, NEPA compliance is the responsibility of the other federal agency. However, WS could agree to complete NEPA documentation at the request of the other federal agency.

WS also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern.

Endangered Species Act (ESA). It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the United States Fish and Wildlife Service (USFWS) to use the expertise of the USFWS to ensure that "any action authorized, funded or carried out by such an agency... is not likely to jeopardize the continued existence of any endangered or threatened species . . . each agency shall use the best scientific and commercial data available" (Sec. 7(a)(2)). WS obtained a Biological Opinion (B.O.) from the U.S. Fish and Wildlife Service describing potential effects on T&E species and prescribing reasonable and prudent measures for avoiding jeopardy (USDA 1997, Appendix F). Additionally, WS conferred with the USFWS in preparation of this EA during 2003, regarding an analysis of potential impacts to Federally listed and candidate species (Appendix D) in NJ.

Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as Amended. The MBTA provides the USFWS regulatory authority to protect families of birds that contain species which migrate outside the United States. The law prohibits any "*take*" of these species by any entities, except as permitted by the USFWS; therefore, the USFWS issues permits to requesters for reducing bird damage. European starlings, feral domestic pigeons, and English sparrows are not classified as protected migratory birds and therefore have no protection under the MBTA.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The U.S. Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into the WS program in New Jersey are registered with and regulated by the EPA and New Jersey Department of Environmental Protection (NJDEP) Pesticide Control Program (PCP) and used by WS in compliance with labeling procedures and other requirements.

Investigational New Animal Drug (INAD). The drug alpha-chloralose (AC) has been used as a sedative for animals and is registered with the Food and Drug Administration (FDA) to capture waterfowl, coots, and pigeons. FDA approval for use under INAD (21 CFR, Part 511) authorized WS to use the drug as a non-lethal form of capture.

Executive Order 13112 of February 3, 1999. This Order prevents the introduction of invasive species and provides for their control to minimize the economic, ecological, and human health impacts that invasive species cause. Pigeons, starlings, and English sparrows are recognized as invasive species that have adverse economic, ecological, and human health impacts.

Executive Order 13186 of January 10, 2001 "Responsibilities of Federal Agencies to Protect Migratory Birds." This Order states that each federal agency, taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations, is directed to develop and implement, a MOU with the USFWS that shall promote the conservation of migratory bird populations. WS has developed a draft MOU with the USFWS as required by this Order and is currently waiting for USFWS approval. WS will abide by the MOU once it is finalized and signed by both parties.

Occupational Safety and Health Act of 1970. The Occupational Safety and Health Act of 1970 and its implementing regulations (29CFR1910) on sanitation standards states that, "Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practical, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected." This standard includes birds that may cause safety and health concerns at workplaces.

The Native American Graves and Repatriation Act of 1990. The Native American Graves Protection and Repatriation Act requires federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal projects would discontinue work until a reasonable effort has been made to protect the items and the proper authority has been notified.

National Historic Preservation Act (NHPA) of 1966 as amended. The NHPA of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. WS actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties. WS activities as described under the proposed action do not cause ground disturbances nor do they otherwise have the potential to significantly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. Bird damage management could benefit historic properties if such properties were being damaged by starling, pigeons or sparrows. In those cases, the officials responsible for management of such properties would make the request and would select the methods to be used in their bird damage management program. Harassment techniques that involve noise making could conceivably disturb users of historic properties if they were used at or in close proximity to such properties; however, it would be an exceedingly rare event for noise producing devices to be used in close proximity to such a property unless the resource being protected from bird damage was the property itself, in which case the primary effect would be beneficial. Also, the use of such devices is generally short term and could be discontinued if any conflicts with historic properties arose. WS has determined BDM actions are not undertakings as defined by the NHPA because such actions do not have the potential to result in changes in the character or use of historic properties.

Environmental Justice and Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." Executive Order 12898, promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Environmental Justice is a priority within APHIS and WS. Executive Order 12898 requires federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies and activities on minority and low-income persons or populations. APHIS implements Executive Order 12898 principally through its compliance with NEPA. All WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898.

WS personnel use only legal, effective, and environmentally safe wildlife damage management methods, tools, and approaches. All chemicals used by WS are regulated by the EPA through FIFRA, New Jersey Department of Environmental Protection, by MOUs with land managing agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used according to label directions, they are selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1997, Appendix P). The WS operational program properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations. In contrast, the proposed action may benefit minority or low-income populations by reducing bird damage such as threats to public health and safety.

Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).
Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed bird damage management program would only occur by using legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

New Jersey Wildlife Laws, Regulations and Policies Regarding Bird Damage Management

New Jersey Statutes Annotated (NJSA) Title 23 contains fish, game, and wildlife law for the State of New Jersey.

1. NJSA 23:4-22 The pole trap is not a legal method to catch birds (such as raptors) in NJ.
2. NJSA 23:4-50(e) English sparrows and European starlings are not protected bird species.
3. NJSA 23:4-50(f) NJ adoption of provisions of the Federal Depredation Order for blackbirds, grackles, and cowbirds (50CFR 21.43).
4. NJSA 23:4-53 Wild or passenger pigeons and their nests and eggs are protected.
5. NJSA 23:4-63.3 and 4. Except as authorized pursuant to a permit issued by the NJDEP, or as provided for by the "Administrative Procedures Act", it is not legal to release indigenous or exotic animals, including birds and their eggs and young, into the environment
6. NJSA 23:4-63.5 and 6. Agricultural landowners may use noise making and other mechanical devices to scare or repel damaging birds or other wildlife in order to prevent the damage and destruction of crops and other property. The NJDFW shall issue permits to authorize this use.
7. NJSA 23:4-16. In order for any person, except the owner or lessee of a building, to possess a loaded firearm within 450 feet on any occupied building, for the purposes of hunting, taking (includes use of a shotgun to harass birds with 12 gauge pyrotechnics), or killing of any animal, written authorization from the owner/lessee is required.

The New Jersey Administrative Code (NJAC) contains regulations necessary to implement laws. Bird damage–related laws and regulations are summarized here.

1. NJAC 7:25-5.22 (b) English sparrows, European starlings, and blackbirds may be taken without a permit when they are damaging crops or other property.
2. NJAC 7:25-5.22(b)(1) Under the Federal Depredation Order 50 CFR 21.43, a person may kill yellow-headed, red-winged, bi-colored red winged, tri-colored red-winged, and Brewer's blackbirds, cowbirds, all grackles, common crows and magpies when found committing or about to commit serious depredations upon any ornamental or shade tree, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. (With this regulation, the NJDFW adopts the provisions of Federal Depredation Order 50 CFR 21.43.)
3. NJAC 7:25-5.22(c) The NJDFW may issue permits for the possession or taking of specific birds.

Policies of the NJDFW regarding wildlife damage management.

1. Policy on Relocation of Wildlife. The Policy identifies situations and requirements pertaining to the relocation of wildlife in NJ. For birds, the policy supports continuation of current practices. Release of rehabilitated passerines is done at the rehabilitation center, and larger birds can be released off site in suitable habitat and at the appropriate time of the year. General release criteria include: 1. release should be as close to the capture/rehabilitation site as possible, 2. avoid overpopulating a given site with the same species, 3. vary release locations to minimize interaction with "nuisance" animals, 4. relocate nesting birds with their young, 5. do not release birds that are unlikely to survive, 6. and unreleasable birds are to be euthanized. Landowner permission must first be obtained prior to release/relocation of birds.

New Jersey Pesticide Laws

New Jersey's pesticide regulations, N.J.A.C. Title 7 Chapter 30, Subchapters 1-12, are implemented and enforced by the NJDEP Pesticide Control Program (PCP). These regulations include processes and requirements for pesticide product registration (Subchapter 2), certification of pesticide dealers (2), licensing of pesticide dealer businesses (3), licensing of commercial pesticide operators (5) and applicators (6), licensing of pesticide applicator businesses (7), certification of private pesticide applicators (8), pesticide exposure management (9), pesticide use (10), grace period regulations (11), and agricultural worker protection (12). In order for WS to apply a restricted use pesticide as part of bird damage management in NJ, the product must be registered with the PCP, the applicator must be licensed, and if a fee is charged, the agency possess a NJ pesticide applicator business license. Additionally, label instructions, and all other pesticide and wildlife laws and regulations must be adhered to (eg. possession of a depredation permit from the USFWS and/or the NJDFW to take the protected bird species). Pesticide products are registered annually, and applicator licenses are obtained and maintained through completion of training courses and examinations conducted through the PCP.

New Jersey Firearm, Trapping and Mechanical Noisemaking Devices Laws

NJAC 7:25-3.1 Describes the process for legal use of propane/acetylene/carbide exploders to harass birds and mammals away from agricultural crops. This process includes completion of an application, inspection of a site by NJDFW personnel, and issuance of a permit by the NJDFW. Only devices with a sound level no greater than 128 decibels at 100 feet from the device may be used.

NJAC 7:25-5.23(b) Identifies the requirements for a rifle permit if in possession of a rifle while conducting certain activities. In NJ, it is not legal to shoot any bird with a rifle.

New Jersey Code of Criminal Justice
2C:39-5c(1) and 58-3 A person in possession of a shotgun must first obtain a firearms purchaser identification card (FID). Exemptions to this are contained in N.J.S. 2C:39-6, and include the provision that no FID is required "To keep or carry any firearm about a person's place of business, residence, premises, or other land owned or possessed by him; a place of business shall be deemed a fixed location."

1.2 SCOPE AND PURPOSE OF THIS EA

The scope and purpose of this EA is to address and evaluate the potential impact to the human environment from the implementation of a WS BDM program to protect agricultural resources; natural resources property; livestock; and public health and safety in New Jersey. Damage problems can occur throughout the State, resulting in requests for WS assistance. Under the Proposed Action, BDM could be conducted on private, federal, state, tribal, county, and municipal lands in New Jersey upon request.

Several bird species have potential to be the subject of WS BDM control activities in New Jersey. Bird species addressed in this EA include feral pigeon (*Columbia livia*), European starling (*Sturnus vulgaris*), red-winged blackbird (*Agelaius phoeniceus*), English sparrow (*Passer domesticus)*, brown-headed cowbird (*Molothrus ater*), common grackle (*Quiscalus quiscula*), American crow (*Corvus brachyrhynchos*), laughing gull (*Larus atricilla*), herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*), greater black-backed gull (*Larus marinus*), mallard duck (*Anas platyrhynchos*), snow goose (*Chen caerulescens*), American black duck (*Anas rubripes*), mute swan (*Cygnus olor*), turkey vulture (*Cathartes aura*), black vulture (*Coragyps atratus*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), domestic waterfowl (ducks and geese) ,as well as eastern meadowlark (*Sturnella magna*), northern mockingbird (*Mimus polyglottos*), gray catbird (*Dumetella carolinensis*), blue jay (*Cyabicutta crustata*), tundra swan (*Cygnus columbianus*), belted kingfisher (*Megaceryle alcyon*), double-crested cormorant (*Phalacrocorax auritus*), fish crow (*Corvus ossifragus*), ring-necked pheasant (*Phasianus colchicus*), snow bunting (*Plectrophenax nivalis*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), cattle egret (*Bubulcus ibis*), little blue heron (*Egretta caerulea*), bank

swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), tree swallow (*Iridoprocne bicolor*) , monk parakeet (*Myiopsitta monachus*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), red-bellied woodpecker (*Melanerpes carolinus*), rough-legged hawk (*Buteo lagopus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and northern harrier (*Circus cyaneus*).

This document does not include consideration of Canada goose damage management environmental issues. In 2002, the WS program conducted a NEPA process and developed an Environmental Assessment entitled, "Canada Goose Damage Management in New Jersey," which evaluated alternatives and impacts to the environment and selected an Integrated Wildlife Damage Management (IWDM) approach to manage damage associated with Canada geese in NJ (USDA 2002). WS Canada goose damage management in NJ will be conducted in accordance with a Finding of No Significant Impact issued for that Environmental Assessment.

1.3 NEED FOR ACTION

Conflicts between humans and wildlife are common in New Jersey. The need for action in New Jersey is based on the necessity for a program to protect agriculture, property, livestock, natural resources, and human health and safety from bird damage. Bird populations can have a negative economic impact in New Jersey. Comprehensive surveys of bird damage in New Jersey have not been conducted. These data represent only a portion of the total damage caused by birds because not all people who experience damage request assistance from WS.

1.3.1 Need for Bird Damage Management to Protect Human Health and Safety

In New Jersey human health and safety concerns and problems associated with birds include, but are not limited to: 1. injuries to people from dive-bombing birds during nest seasons, 2. transmission of zoonotic diseases to humans, and 3. bird-aircraft strikes. During FY 2000-02, NJ residents have reported incidences of northern mockingbirds, gray catbirds, and blue jays dive-bombing people, sometimes with infliction of injuries. These situations typically occur on private properties near the home or garage during the bird nesting season.

Birds play an important role in the transmission of zoonotic diseases to humans such as Encephalitis, West Nile Virus, Psittacosis, and Histoplasmosis. Public health officials and residents at such sites express concerns for human health related to the potential for disease transmission where dropping deposits accumulate. Some bird species form large communal roosts of the kind associated with disease organisms which grow in soils enriched by bird excrement, such as *Histoplasma capsulatum* (Weeks and Stickley 1984). Sometimes, such roosts occur in urban and suburban areas.

Feral domestic pigeons, English sparrows, and European starlings have been suspected in the transmission of 29 different diseases to humans (Davis et al. 1971, Stickley and Weeks 1985, and Weber 1979). These include viral diseases such as meningitis and seven different forms of encephalitis; bacterial diseases such as erysipeloid, salmonellosis, paratyphoid, Pasteurellosis, and Listeriosis; mycotic (fungal) diseases such as aspergillosis, blastomycosis, candidiasis, cryptococcosis, histoplasmosis, and sarcosporidiosis; protozoal diseases such as American trypansomiasis and toxoplasmosis; and rickettsial/chlamydial diseases such as chlamydiosis and Q fever. As many as 65 different diseases transmittable to humans or domestic animals have been associated with pigeons, European starlings, and English sparrows (Weber 1979). Table 1-1 shows the more typical diseases affecting humans that can be transmitted by pigeons, English sparrows, and European starlings.

Research has shown that gulls carry various species of bacteria such as *Bacillus* sp., *Clostridium* sp., *Campylobacter* spp., *Escherichia coli*, *Listeria* spp., and *Salmonella* spp. (MacDonald and Brown 1974, Fenlon 1981, Butterfield et al. 1983, Monaghan et al. 1985, Norton 1986, Vauk-Hentzelt et al. 1987, Quessey and Messier 1992). Transmission of bacteria from gulls to humans is difficult to document,

however, Reilley et al. (1981) and Monaghan et al. (1985) both suggested that gulls were the source of contamination for cases of human salmonellosis. Concentrations of gulls at municipal water supply sources and waste water and sewage treatment facilities may also contribute to disease transmission (Jones et al. 1978, Hatch 1996). Public health concerns often arise when gulls feed and loaf near fast food restaurants, and picnic facilities; deposit waste from landfills in urban areas; and contaminate industrial facility ventilation systems with feathers, nesting debris, and droppings. Gulls feeding on vegetable crops and livestock feed can potentially aid in the transmission of salmonella.

In most cases, in which human health concerns are a major reason for requesting BDM, no actual cases of bird transmission of disease to humans have been proven to occur. Thus, it is the risk of disease transmission that is the primary reason for requesting and conducting BDM. Situations in New Jersey where the threat of disease associated with bird populations might occur could be:

- exposure by residents to a European starling roost which has been in a residential area for more than three years;
- disturbance of a large deposit of droppings in an attic where a flock of feral domestic pigeons routinely roosts or nests;
- accumulated droppings from roosting European starlings, feral domestic pigeons, or English sparrows on structures at an industrial site where employees must work in areas of accumulation
- Gulls, English sparrows or European starlings nesting or loafing around a food court area of a recreational facility or other site where humans eat in close proximity to concentrated numbers of these birds.
- Gulls depositing waste from landfills in urban, suburban and other nearby areas;

Table 1-1. Diseases transmissible to humans and livestock that are associated with feral domestic pigeons, European starlings, and English sparrows (from Weber 1979).

Disease	Human Symptoms	Potential for Human Fatality	Effects on Domestic Animals
Bacterial:			
Erysipeloid	skin eruption with pain, itching; headaches, chills, joint pain, prostration, fever, vomiting	sometimes - particularly to young children, old or infirm people	serious hazard for the swine industry
Salmonellosis	gastroenteritis, septicaemia, persistent infection	possible, especially in individuals weakened by other disease or old age	causes abortions in mature cattle, possible mortality in calves, decrease in milk production in dairy cattle
Pasteurellosis	respiratory infection, nasal discharge, conjunctivitis, bronchitis, pneumonia, appendicitis, urinary bladder inflammation, abscessed wound infections	rarely	may fatally affect chickens, turkeys and other fowl
Listeriosis	conjunctivitis, skin infections, meningitis in newborns, abortions,	sometimes - particularly with newborns	In cattle, sheep, and goats, difficulty swallowing, nasal

	premature delivery, stillbirth		discharge, paralysis of throat and facial muscles
Viral:			
Meningitis	inflammation of membranes covering the brain , dizziness, and nervous movements	possible — can also result as a secondary infection with listeriosis, salmonellosis, cryptococcosis	causes middle ear infection in swine, dogs, and cats
Encephalitis (7 forms)	headache, fever, stiff neck, vomiting, nausea, drowsiness, disorientation	mortality rate for eastern equine encephalomyelitis may be around 60%	may cause mental retardation, convulsions and paralysis
Mycotic (fungal):			
Aspergillosis	affects lungs and broken skin, toxins poison blood, nerves, and body cells	not usually	causes abortions in cattle
Blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	rarely	affects horses, dogs and cats
Candidiasis	infection of skin, fingernails, mouth, respiratory system, intestines, and urogenital tract	rarely	causes mastitis, diarrhea, vaginal discharge and aborted fetuses in cattle
Cryptococcosis	lung infection, cough, chest pain, weight loss, fever or dizziness, also causes meningitis	possible especially with meningitis	chronic mastitis in cattle, decreased milk flow and appetite loss
Histoplasmosis	pulmonary or respiratory disease. May affect vision	possible, especially in infants and young children or if disease disseminates to the blood and bone marrow	actively grows and multiplies in soil and remains active long after birds have departed
Protozoal:			
American Trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons
Toxoplasmosis	inflammation of the retina, headaches, fever, drowsiness, pneumonia, strabismus, blindness, hydrocephalus, epilepsy, and deafness	possible	may cause abortion or still birth in humans, mental retardation
Rickettsial /Chlamydial:			
Chlamydiosis	pneumonia, flu-like respiratory infection, high fever, chills, loss of appetite, cough, severe headaches, generalized	occasionally, restricted to old, weak or those with concurrent diseases	in cattle, may result in abortion, arthritis, conjunctivitis, and enteritis

	aches pains, vomiting, diarrhea, hepatitis, insomnia, restlessness, low pulse rate		
Q Fever	sudden pneumonitis, chills, fever, weakness, severe sweating, chest pain, severe headaches and sore eyes	possible	may cause abortions in sheep and goats

Individuals or property owners, requesting assistance with feral domestic pigeon, gulls, English sparrow or European starling roost problems, are often concerned about potential disease risks, but may be unaware of the types of diseases that can be associated with these birds. In most such situations, BDM is requested because the mess associated with droppings left by concentrations of birds is aesthetically displeasing, and results in continual clean-up costs and a degraded quality of life for residents. Under the proposed action, WS could agree to assist in resolving these types of problems.

1.3.2 Need for Bird Damage Management at Airports

The threat to human safety from aircraft collisions with wildlife (wildlife strikes) is increasing (Dolbeer 2000, MacKinnon et al. 2001). The risk that birds pose to aircraft is well documented with one of the worst cases occurring in Boston in 1960 when 62 people were killed in the crash of an airliner which collided with a flock of European starlings (Terres 1980). Other examples include the following strike reports (Wright 2003):

- American Kestrel. In July, 1996, a B-737 struck a single American kestrel at Nashville International Airport (TN), resulting in a compressor stall and an aborted take-off. The aircraft overran the runway, and one passenger was seriously injured. Four others received minor injuries.

- Brown-Headed Cowbirds. In February, 1973, a Learjet 24 departing Peachtree-Dekalb Airport (Atlanta, GA) struck a flock of brown-headed cowbirds attracted to a nearby trash-transfer station. Engine failure resulted in a crash, and the deaths of 8 people.

- Double-Crested Cormorants. In October, 2002 at Logan International Airport (Boston, MA), a B-767 struck a flock of double-crested cormorants, resulting in an engine shut down, precautionary landing, and damage to the engine and landing lights. The aircraft was out of service for 3 days, and repairs cost $1.7 million.

- European Starlings. In February, 1999, when a B-757 struck a flock of European starlings at the Cincinnati / Northern Kentucky International Airport and was forced to abort the flight (NTSB 1999). Damages were assessed at more than $500,000 by airport officials (D.T. Little, WS Pers. Comm. 1999).

- Red-Tailed Hawk. In December, 1999 at the Toledo Express Airport (OH), a B-747 struck a red-tailed hawk, resulting in an engine fire and a precautionary landing (aircraft out of service for 84 hours). Cost to repair the aircraft was $1.3 million.

Generally, bird collisions occur when aircraft are near the ground. From 1990-2001, approximately 56% of reported bird strikes to U.S. civil aviation occurred when the aircraft was at an altitude of 100 feet above ground level or less (Cleary et al. 2002). Additionally, 78% occurred under 900 feet above ground level and about 86% occurred under 2,000 feet above ground level (Cleary et al. 2002). From 1990-2001, birds were involved in more than 97% of the reported wildlife strikes to civil aircraft in the USA (Cleary et al.

2002). Nationally, gulls (27% of strikes between 1999 and 2001), doves (13%), raptors (12%), and waterfowl (11%) were the most frequently struck bird groups (Cleary et al. 2002). The cost of wildlife strikes to the civil aviation industry in the U.S. is estimated to be in excess of 534,361 hours/year of aircraft down time and $469.8 million in monetary losses (Cleary et al. 2002).

In NJ, there are three air carrier airports (Newark International, Atlantic City International, and Trenton Mercer), and approximately 46 civilian, private-use airports. According to the Federal Aviation Administration's National Wildlife Strike Database (Cleary et al. 2002 and online strike database http//www:wildlife-mitigation.tc.faa.gov), during 1990-2002, thirteen NJ civil public use airports reported a total of 1263 bird-aircraft collisions to the FAA. These reported strikes involved at least 51 different bird species, with the greatest number of strikes involving the following bird species/species groups: gulls (177 strikes), American kestrels (82), European starlings (47), mallards (40), sparrows (38), Canada geese (35), pigeons (33), eastern meadowlark (31), mourning dove (29), hawks (26), and herring gulls (21). The number of bird strikes actually occurring is likely to be much greater, since an estimated 80% of civil bird strikes go unreported (Cleary et al. 2000).

WS receives requests for assistance regarding bird damage management at civil airports and military airfields in New Jersey. These requests are considered serious because of the potential for loss of human life and because damage to aircraft can be extremely expensive. With the implementation of an Integrated BDM program in New Jersey, WS could provide direct management and technical assistance at the request of aviation facilities in the State.

1.3.3 Need for Bird Damage Management at Cattle Feeding and Dairy Cattle Facilities

European starlings, brown-headed cowbirds, common grackles, English sparrows, and, to a lesser extent, pigeons, often cause damage at cattle feeding facilities and dairies by congregating in large numbers to feed on the grain component of cattle feed. Such feeding activities present disease threats to livestock at these sites. The birds also cause damage by defecating on fences, shade canopies, and other structures, which can accelerate corrosion of metal components and which generally is considered an unsightly nuisance and potential health hazard for the feedlot/dairy operators and their personnel.

Contributions of Livestock and Dairies to the NJ Economy.
Livestock and dairy production in NJ contribute substantially to the State's economy. In 2001, NJ feedlot operators maintained 44,000 cattle and calves valued at an estimated $44.9 million (NJDA 2003 website). Milk production in NJ totaled 233 million pounds in 2001, valued at an estimated $37.5 million. The leading milk producing counties were Salem, Sussex, Warren, Burlington, and Hunterdon. There were an estimated 13,000 milk cows, 8,000 beef cows, and 13,000 hogs and pigs in NJ during 2001.

Scope of Livestock Feed Losses. The problem of starling damage to livestock feed has been documented in France and Great Britain (Feare 1984), and in the United States (Besser et al. 1968). The concentration of larger numbers of cattle eating huge quantities of feed in confined pens results in a tremendous attraction to European starlings, blackbirds and feral domestic pigeons. Diet rations for cattle contain all of the nutrients and fiber that cattle need, and are so thoroughly mixed that cattle are unable to select any single component over others. The basic constituent of most rations is silage and the high energy portion is usually provided as barley, which may be incorporated as whole grain or crushed or ground cereal. While cattle cannot select individual ingredients from that ration, European starlings can and do select the barley, thereby altering the energetic value of the complete diet. The removal of this high energy fraction by European starlings, is believed to reduce milk yields, weight gains, and is economically critical (Feare 1984). Glahn and Otis (1986) reported that starling damage was also associated with proximity to roosts, snow, and freezing temperatures and the number of livestock on feed.

The economic significance of feed losses to European starlings has been demonstrated by Besser et al. (1968) who concluded that the value of losses in feedlots near Denver, Colorado was $84 per 1,000 birds in 1967. Forbes (1995) reported European starlings consume up to 50% of their body weight in feed each

day. Glahn and Otis (1981) reported losses of 4.8 kg of pelletized feed consumed per 1,000 bird minutes. Glahn (1983) reported that 25.8% of farms in Tennessee experienced starling depredation problems of which 6.3% experienced considerable economic loss. Williams (1983) estimated seasonal feed losses to five species of blackbirds (primarily brown-headed cowbirds) at one feedlot in south Texas at nearly 140 tons valued at $18,000.

Scope of Livestock Health Problems. A number of diseases that affect livestock have been associated with feral domestic pigeons, European starlings, and English sparrows (Weber 1979). Transmission of diseases such as Transmissible Gastroenteritis Virus (TGE), Tuberculosis (TB), and Coccidiosis to livestock has been linked to migratory flocks of European starlings. Estimates of the dollar value of this type of damage are not available. A consulting veterinarian for a large cattle feeding facility in Texas indicated problems associated with coccidiosis declined following reduction of starling numbers using the facility (R. Smith, WS, Canyon District, TX, Pers. Comm.). Williams et al. (1977) and Johnston et al. (1979) reported that gulls can transmit salmonella to livestock through droppings and contaminated drinking water.

1.3.4 Need for Bird Damage Management Related to Other Agricultural Resources

Several studies have shown that blackbirds and European starlings can pose a great economic threat to agricultural producers (Besser et. al. 1968, Dolbeer et.al. 1978, and Feare 1984). Fruit and nut crops can be damaged by blackbirds, American crows, gulls, and other birds. Starlings and sparrows can also have a detrimental impact on agricultural food production by feeding at vineyards, orchards, gardens, crops, and feedlots (Weber 1979). For example, starlings feed on numerous types of fruits such as, cherries, figs, blueberries, apples, apricots, grapes, nectarines, peaches, plums, persimmons, strawberries, and olives (Weber 1979). Starlings were also recently found to damage ripening corn (Johnson and Glahn 1994) and are known to feed on the green, milk and dough stage kernels of sorghum (Weber 1979). Additionally, starlings may pull sprouting grains, especially winter wheat, and feed on planted seed (Johnson and Glahn 1994). Sparrows damage crops by pecking seeds, seedlings, buds, flowers, vegetables, and maturing fruits (Fitzwater 1994), and localized damage can be great because sparrows often feed in large flocks on a small area (Fitzwater 1994).

There are five major fruit and berry crops grown in NJ: apples, blueberries, cranberries, peaches, and strawberries (NJDA website 2003). Total production during 2001 amounted to 226 million pounds, with the value of utilized production estimated at $82.4 million. Fresh market vegetables total value during 2001 was $139 million. Production value was greatest for Jersey Fresh tomatoes ($28 million), bell peppers ($27.8 million), sweet corn ($15.7 million), and cucumbers ($9.45 million). Total value of NJ field crops during 2001 was $64 million, with greatest values occurring for hay ($27.9 million), corn for grain ($14.8 million), and soybeans for beans ($12.7 million). In New Jersey, bird damage to agricultural resources reported to WS includes, but is not limited to the following: 1. tundra swan damage to cranberry bogs, 2. corn sprout pulling by crows, 3. snow goose depredation on winter wheat, 4. laughing gull depredation on blueberries, 5. snow goose damage to commercial salt hay, pasture, and winter wheat, 6. black vulture predation on calves, lambs, and other livestock, and 7. bird damage to equine facilities and resources. These and other wildlife damage problems were reported to the USFWS during FY 2002 by NJ farmers on their applications for Federal depredation permits to take migratory birds.

Table 1-2. Diseases of livestock that have been linked to feral domestic pigeons, European starlings, and/or English sparrows. Information from Weber (1979).

Disease	Livestock affected	Symptoms	Comments
Bacterial:			
Erysipeloid	cattle, swine, horses, sheep, goats, chickens, turkeys, ducks	Pigs - arthritis, skin lesions, necrosis, septicemia Sheep - lameness	serious hazard for the swine industry, rejection of swine meat at slaughter due to speticemia, also affects dogs
Salmonellosis	all domestic animals	abortions in mature cattle, mortality in calves, decrease in milk production in dairy cattle Colitis in pigs,	over 1700 serotypes
Pasteurellosis	cattle, swine, horses, rabbits, chickens, turkeys	Chickens and turkeys die suddenly without illness pneumonia, bovine mastitis, abortions in swine, septicemia, abscesses	also affects cats and dogs
Avian Tuberculosis	chickens, turkeys, swine, cattle, horses, sheep	Emaciation, decrease in egg production, and death in poultry. Mastitis in cattle	also affects dogs and cats
Streptococcosis	cattle, swine, sheep, horses, chickens, turkeys, geese, ducks, rabbits	Emaciation and death in poultry. Mastitis in cattle, abscesses and inflamation of the heart , and death in swine	feral pigeons are susceptible and aid in transmission
Yersinosis	cattle, sheep, goats, horses, turkeys, chickens, ducks	abortion in sheep and cattle	also affects dogs and cats
Vibriosis	cattle and sheep	In cattle, often a cause of infertility or early embryonic death. In sheep, the only known cause of infectious abortion in late pregnancy	of great economic importance
Listeriosis	Chickens, ducks, geese, cattle, horses, swine, sheep, goats	In cattle, sheep, and goats, difficulty swallowing, nasal discharge, paralysis of throat and facial muscles	also affects cats and dogs
Viral:			
Meningitis	cattle, sheep, swine, poultry	inflamation of the brain, newborn calves unable to suckle	associated with listeriosis, salmonellosis, cryptococcosis

Disease	**Livestock Affected**	**Symptoms**	**Comments**
Encephalitis (7 forms)	horses, turkeys, ducks	drowsiness, inflamation of the brain	mosquitoes serve as vectors
Mycotic (fungal):			
Aspergillosis	cattle, chickens, turkeys, and ducks	abortions in cattle	common in turkey poults
Blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	Rarely	affects horses, dogs and cats
Candidiasis	cattle, swine, sheep, horses, chickens, turkeys	In cattle, mastitis, diarrhea, vaginal discharge, and aborted fetuses	causes unsatisfactory growth in chickens
Cryptococcosis	cattle, swine, horses	chronic mastitis in cattle, decreased milk flow and appetite loss	also affects dogs and cats
Histoplasmosis	horses cattle and swine	(in dogs) chronic cough, loss of appetite, weakness, depression, diarrhea, extreme weight loss	also affects dogs; actively grows and multiplies in soil and remains active long after birds have departed
Coccidiosis	poultry, cattle, and sheep	bloody diarrhea in chickens, dehydration, retardation of growth	almost always present in English sparrows; also found in pigeons and European starlings
Protozoal:			
American Trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons
Toxoplasmosis	cattle, swine, horses, sheep, chickens, turkeys	In cattle, muscular tremors, coughing, sneezing, nasal discharge, frothing at the mouth, prostration and abortion	also affects dogs and cats
Rickettsial/ Chlamydial:			
Chlamydiosis	cattle, horses, swine, sheep, goats, chickens, turkeys, ducks, geese	In cattle, abortion, arthritis, conjunctivitis, enteritis	also affects dogs and cats and many wild birds and mammals
Q Fever	affects cattle, sheep, goats, and poultry	may cause abortions in sheep and goats	can be transmitted by infected ticks

1.3.5 Need for Bird Damage Management to Protect Property

Birds frequently damage structures on private property or public facilities with fecal contamination. Accumulated bird droppings can reduce the functional life of some building roofs by 50% (Weber 1979). Corrosion damage to metal structures and painted finishes, including those on automobiles, can occur because of uric acid from bird droppings. Electrical utility companies frequently have problems with birds causing power outages by shorting out transformers and substations. Persons and businesses concerned about these types of damage may request WS assistance.

Pigeons, starlings, sparrows and other nesting and roosting birds cause damage to aircraft in hangars. Accumulation of feces on airplanes, helicopters, maintenance equipment, and hangar floors results in unscheduled maintenance to clean planes and buildings to protect painted surfaces from acidic fecal droppings and maintain a sanitary work environment. Furthermore, birds may build nests in engines of idle aircraft which may cause engine damage or cause a fire.

Vultures tear and consume latex window calking or rubber gaskets sealing window panes, rubber roof linings, asphalt and cedar roof shingles, vinyl seat covers from boats and tractors, and plastic flowers at cemeteries (Lowney 1999). Black vultures have been observed preying on livestock, including pigs, calves, goats, horses, cats, dogs, and turkeys (Lowney 1999, Lovell 1947, Lovell 1952, Parmalee 1954, Roads 1936, Sprunt 1946). Roof-top colonies of nesting gulls have been well documented and frequently cause damage to urban and suburban structures. Gulls transport large amounts of nest material and food remains to the roof-tops which can obstruct roof drainage systems and lead to structural damage to buildings (Vermeer et al. 1988, Blokpoel and Scharf 1991, Belant 1993).

Gull attraction to landfills as a food source has been well documented (Mudge and Ferns 1982, Patton 1988, Belant et al. 1995a, 1998, Gabrey 1997). Large numbers of gulls are attracted to and use landfills as feeding and loafing areas throughout North America. In the northeastern United States, landfills often serve as foraging and loafing areas for gulls throughout the year, while attracting larger populations of gulls during migration periods (Bruleigh 1998). Landfills have even been suggested as contributing to the increase in gull populations (Verbeek 1977, Patton 1988, Belant and Dolbeer 1993). Gulls that visit landfills may loaf and nest on nearby rooftops, causing health concerns and structural damage to buildings and equipment. Bird conflicts associated with landfills include accumulation of feces on equipment and buildings, distraction of heavy machinery operators, and the potential for birds to transmit disease to workers on the site. The tendency for gulls to carry waste off site results in accumulation of feces and deposition of garbage on surrounding industrial and residential areas which creates a nuisance, as well as generates the potential for birds to transmit disease to neighboring residents.

In NJ, bird damage to property includes, but is not limited to: 1. black vultures and turkey vultures harming or preying on exhibit/zoo animals and livestock, 2. gull feces damage to boats, marina's, decks, and other property, 3. mallard and other waterfowl damage to lawns, decks and other property, and 4. bird feces, feathers and other damage to property associated with roosts. Additional bird species involved in property damage problems reported to WS include northern cardinals, American crows, feral ducks, feral geese, snow geese, great blue herons, pigeons, barn swallows, mute swans, woodpeckers, and others.

1.3.6 Need for Bird Damage Management to Protect Natural Resources

Some of the species listed as threatened or endangered under the Endangered Species Act of 1973 are preyed upon or otherwise adversely affected by certain bird species, including herring gulls and great black-backed gulls. In NJ, mute swans and snow geese impact wetland habitats through grazing and trampling. Brood parasitism by brown-headed cowbirds has become a concern for many wildlife professionals where these birds are plentiful. Inter-specific nest competition has been well documented in brown-headed cowbirds. The brown-headed cowbird may function most prominently in negatively impacting other bird species. These birds successfully parasitize the nests of songbirds by laying 1 or

sometimes 2 eggs per host nest and laying up to 25 or more eggs per nesting season (Dolbeer 1994). The brown headed cowbird is a species that is known to parasitize the nests of at least 158 other bird species (Friedman 1929) and is thought to be responsible for the decline in populations of many species of resident and migrant birds. With endangered bird species, such parasitism may cause enough nest failures to jeopardize the host species.

Interspecific nest competition has been well documented in European starlings. Miller (1975) and Barnes (1991) reported European starlings were responsible for a severe depletion of the eastern bluebird (*Sialis sialis*) population due to nest competition. Nest competition by European starlings has also been known to adversely impact American kestrels (sparrow hawks) (Von Jarchow 1943, Nickell 1967, and Wilmer 1987), red-bellied woodpeckers (*Centurus carolinus*), Gila woodpeckers (Centurus uropygial is) (Kerpez and Smith 1990 and Ingold 1994), and wood ducks (*Aix sponsa*) (Shake 1967, McGilvery and Uhler 1971, Heusmann et.al. 1977, and Grabill 1977). Weitzel (1988) reported nine native species of birds in Nevada had been displaced by starling nest competition, and Mason et al. (1972) reported European starlings evicting bats from nest holes.

Soil erosion and sedimentation can cause damage to natural resources. Excessive numbers of feral and domestic waterfowl (ducks, geese, mute swans) can remove or trample bank vegetation resulting in erosion of the shoreline and soil sediments being carried by rainwater into lakes, ponds and reservoirs. Waterfowl may cause damage to natural vegetation, shorelines, parks, ponds, and lakes.

Waterfowl are considered by the American Association of Wildlife Veterinarians (AAWV) as susceptible to and carriers of disease and parasites. Because of the potential threat to free-ranging waterfowl, the AAWV put forth the following resolution (AAWV, undated):

> ...wild and semi-domestic ducks, geese and swans are susceptible to and carriers of disease and parasites of free-ranging wild ducks, geese, and other birds;..."
>
> ...the AAWV encourages local authorities and state and federal agencies to cooperate to limit the population of waterfowl on urban water areas to prevent disease outbreaks in semidomestic as well as free ranging ducks, geese and swans and discourages the practice of relocating nuisance or excess urban ducks, geese and swans to other parks or wildlife areas as a means of local population control."

1.4 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

ADC Programmatic Environmental Impact Statement. WS, previously called Animal Damage Control (ADC), has issued a Final EIS on the national APHIS/WS program (USDA 1997). Pertinent and current information available in the EIS has been incorporated by reference into this EA.

USFWS Mute Swan Environmental Assessment and Finding of No Significant Impact. In August, 2003, the U.S. FWS issued a Finding of No Significant Impact and a Final Environmental Assessment for the management of mute swans in the Atlantic Flyway, which will support implementation of the Atlantic Flyway Mute Swan Management Plan (USFWS 2003). Pertinent and current information contained in the FWS swan EA has been incorporated by reference into this EA.

Wildlife Services Canada Goose Damage Management Environmental Assessment and Finding of No Significant Impact. In 2002, the WS NJ program issued a Finding of No Significant Impact and a Final Environmental Assessment entitled, "Canada Goose Damage Management in New Jersey," which evaluated alternatives and impacts to the environment and selected an Integrated Wildlife Damage Management (IWDM) approach to manage damage associated with Canada geese in NJ (USDA 2002).

1.5 WS RECORD KEEPING REGARDING REQUESTS FOR BIRD DAMAGE MANAGEMENT ASSISTANCE

WS maintains a Management Information System (MIS) database to document assistance that the agency provides in addressing wildlife damage conflicts. MIS data is limited to information that is collected from people who have requested services or information from Wildlife Services. It does not include requests received or responded to by local, State or other Federal agencies, and it is not a complete database for all wildlife damage occurrences. The number of requests for assistance does not necessarily reflect the extent of need for action, but this data does provide an indication that needs exists.

The database includes, but is not limited to, the following information: species of wildlife involved, the number of individuals involved in a damage situation; tools and methods used or recommended to alleviate the conflict; and the resource that is in need of protection. Table 1-3 provides a summary of Technical Assistance projects completed by the New Jersey WS program for Fiscal Years 1997-2002. A description of the WS Direct Control and Technical Assistance programs is contained in Chapter 3 of this EA.

Table 1-3*. Annual number of incidents for technical assistance involving birds (except Canada geese) for New Jersey Wildlife Services during 1997-2002.

Fiscal Year	Agriculture	Human Health and Safety	Property	Natural Resources	Total
1997	17	8	65	1	91
1998	15	5	66	1	87
1999	16	9	62	0	87
2000	16	8	76	1	101
2001	15	24	69	0	108
2002	24	27	100	2	153
Total	103	81	438	5	627

Data presented in this table were taken from NJ WS Annual Program Reports and represent the number of technical assistance projects conducted by the NJ WS program and do not include data from operational projects conducted during the time period covered

1.6 PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) proposes to continue the current damage management program that responds to bird damage in the State of New Jersey. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce bird damage to property, agricultural resources (including livestock), natural resources, and human/public health and safety. Damage management would be conducted on public and private property in New Jersey when the resource owner (property owner) or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed as humanely as possible using shooting, trapping, and registered pesticides and other products. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or could include instances where application of lethal methods alone would be the most appropriate strategy.

1.7 DECISION TO BE MADE

Based on the scope of this EA, the decisions to be made are:

- Should WS implement an integrated bird damage management strategy, including technical assistance and direct control, to meet the need for bird damage management in New Jersey?
- If not, should WS attempt to implement one of the alternatives to an integrated bird damage management strategy as described in the EA?
- Would the proposed action have significant impacts on the quality of the human environment, requiring preparation of an EIS?

1.8 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS

1.8.1 Actions Analyzed

This EA evaluates bird damage management by WS to protect: 1) property; 2) agricultural resources; 3) natural resources; 4) livestock and dairies; and 5) public health and safety in New Jersey. Protection of other resources or other program activities would be addressed in other NEPA analysis, as appropriate.

1.8.2 American Indian Lands and Tribes

Currently, New Jersey WS does not have any MOUs with any American Indian tribes. If WS enters into an agreement with a tribe for BDM, this EA would be reviewed and supplemented, if appropriate, to insure compliance with NEPA. MOUs, agreements and NEPA documentation would be prepared as appropriate before conducting BDM on tribal lands.

1.8.3 Period for which this EA is Valid

This EA would remain valid until the WS program in New Jersey and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA is sufficient.

1.8.4 Site Specificity

This EA analyzes the potential impacts of BDM and addresses activities on all lands in New Jersey under MOUs, Cooperative Agreements and in cooperation with the appropriate public land management agencies. It also addresses the impacts of BDM on areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional BDM efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

Planning for the management of bird damage must be viewed as being conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, insurance companies, etc. Although some of the sites where bird damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever bird damage and resulting management occurs, and are

treated as such. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in New Jersey (see Chapter 3 for a description of the Decision Model and its application).

The analyses in this EA are intended to apply to any action that may occur *in any locale* and at *any time* within the State of New Jersey. In this way, APHIS-WS believes it meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to accomplish its mission.

1.8.5 Summary of Public Involvement

Issues related to the proposed action were initially developed by WS. Issues were defined and preliminary alternatives were identified. As part of this process, and as required by the Council on Environmental Quality (CEQ 1981) and APHIS-NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" (NOA) published in local media and through direct mailings of NOA to parties that have specifically requested to be notified. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and its Decision should be revisited and, if appropriate, revised.

1.9 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four (4) chapters and four (4) appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, mitigation, and standard operating procedures (SOP). Chapter 4 analyzes environmental consequences and the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers and those consulted during this EA process. Appendix A is a list of the literature cited during the preparation of the EA and Appendix B is a detailed description of the methods used for BDM in New Jersey. Appendices C-F are comprehensive lists of Federal and NJ T&E species and correspondence with the NJDFW and FWS regarding T&E species.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues, including issues that received detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues used to develop mitigation measures and SOPs, and issues not considered in detail, with the rationale. Pertinent portions of the affected environment are included in this chapter and in the discussion of issues used to develop mitigation measures. Additional affected environments are incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the proposed program in Chapter 3.

2.1 AFFECTED ENVIRONMENT

The areas of the proposed action could include areas in and around commercial, industrial, public, and private buildings, facilities and properties and at other sites where birds may roost, loaf, feed, nest or otherwise occur. Examples of areas where wildlife damage management activities could be conducted are, but are not necessarily limited to: agricultural fields, vineyards, orchards, farmyards, dairies, ranches, livestock operations, grain mills, grain handling areas, railroad yards, waste handling facilities, bridges, industrial sites, natural areas, government properties and facilities, private homes and properties, corporate properties, schools, hospitals, parks and recreation areas (including sports fields, playgrounds, swimming pools, etc.), swimming lakes, communally-owned homeowner/property owner association properties, natural areas, wildlife refuges, wildlife management areas, coastal and tidal beaches, ponds, rivers, and inlets, airports and surrounding areas.

2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4

The following issues have been identified as areas of concern requiring consideration in this EA. These will be analyzed in detail in Chapter 4:

- Effects on target bird species
- Effects on other wildlife species, including T&E species
- Effects on human health and safety
- Impacts to stakeholders, including aesthetics
- Humaneness and animal welfare concerns of methods used

2.2.1 Effects on Target Bird Species

Of interest to WS, program recipients, decision-makers, and members of the public is whether wildlife damage management actions adversely affect the viability of target species populations. The target species selected for analysis in this EA are feral pigeon (*Columbia livia*), European starling (*Sturnus vulgaris*), red-winged blackbirds (*Agelaius phoeniceus*), English sparrow (*Passer domesticus)*, brown-headed cowbird (*Molothrus ater*), common grackle (*Quiscalus quiscula*)}, American crow (*Corvus brachyrhynchos*), laughing gull (*Larus atricilla*), herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*), greater black-backed gull (*Larus marinus*), mallard duck (*Anas platyrhynchos*), snow goose (*Chen caerulescens*), American black duck (*Anas rubripes*), mute swan (*Cygnus olor*), turkey vulture (*Cathartes aura*), black vulture (*Coragyps atratus*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), domestic waterfowl (ducks and geese), as well as eastern meadowlark (*Sturnella magna*), northern mockingbird (*Mimus polyglottos*), gray catbird (*Dumetella carolinensis*), blue jay (*Cyabicutta crustata*), tundra swan (*Cygnus columbianus*), belted kingfisher (*Megaceryle alcyon*), double-crested cormorant (*Phalacrocorax auritus*), fish crow (*Corvus ossifragus*), ring-necked pheasant (*Phasianus colchicus*), snow bunting (*Plectrophenax nivalis*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), cattle egret (*Bubulcus ibis*), little blue heron (*Egretta caerulea*), bank

swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), tree swallow (*Iridoprocne bicolor*), monk parakeet (*Myiopsitta monachus*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), red-bellied woodpecker (*Melanerpes carolinus*), rough-legged hawk (*Buteo lagopus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and northern harrier (*Circus cyaneus*).

Impacts of West Nile virus on bird populations. West Nile (WN) virus has emerged in recent years in temperate regions of North America, with the first appearance of the virus in North America occurring in New York City in 1999 (MMWR 2002, Rappole et al. 2000). Since 1999 the virus has spread across the United States and was reported to occur in 44 states and the District of Columbia in 2002 (MMWR 2002). West Nile virus is typically transmitted between birds and mosquitoes. Mammals can become infected if bitten by an infected mosquito, but individuals in most species of mammals do not become ill from the virus. The most serious manifestation of the WN virus is fatal encephalitis in humans, horses, and birds. West Nile virus has been detected in dead bird species of at least 138 species (CDC 2003). Although birds infected with WN virus can die or become ill, most infected birds do survive and may subsequently develop immunity to the virus (CDC 2003, Cornell University 2003). In some bird species, particularly Corvids (crows, blue jays, ravens, magpies), the virus causes disease (often fatal) in a large percentage of infected birds (Audubon 2003, CDC 2003, Cornell University 2003, MMWR 2002). In 2002, WN virus surveillance/monitoring programs revealed that Corvids accounted for 90% of the dead birds reported with crows representing the highest rate of infection (MMWR 2002). Large birds that live and die near humans (i.e. crows) have a greater likelihood of being discovered, therefore the reporting rates tend to be higher for these bird species and are a "good indicator" species for the presence of WV virus in a specific area (Cornell University 2003, Audubon 2003). According to US Geological Survey (USGS), National Wildlife Health Center (2003), information is not currently available to know whether or not WN virus is having an impact on bird populations in North America. USGS states that it is not unusual for a new disease to cause high rates of infection or death because birds do not have the natural immunity to the infection. Furthermore, it is not known how long it will take for specific bird population to develop sufficient immunity to the virus. Surveys of wild birds completed in the last three years have shown that some birds have already acquired antibodies to the virus (USGS-WHC 2003). Based upon available Christmas Bird Counts and Breeding Bird Surveys, USGS-WHC (2003) states that there have been declines in observations of many local bird populations, however they do not know if the decline can be attributed to WN virus or to some other cause. A review of available crow population data by Audubon (2003) reveals that at least some local crow populations are suffering high WN virus related mortality, but crow numbers do not appear to be declining drastically across broad geographic areas. USGS does not anticipate that the commonly seen species, such as crows and blue jays, will be adversely affected by the virus to the point that these bird species will disappear from the U.S. (USGS-WHC 2003).

2.2.2 Effects on Other Wildlife Species, including T&E Species

WS and the rest of the wildlife management profession, as well as the public, are concerned about whether the proposed action or any of the alternatives might result in adverse impacts to populations of other wildlife, especially T&E species. WS' mitigation measures and SOPs are designed to reduce the effects on non-target species' populations and are presented in Chapter 3. To reduce the risks of adverse affects to non-target species, WS would select damage management methods that are target-selective or apply such methods in ways to reduce the likelihood of capturing or killing non-target species.

Threatened and Endangered (T&E) species lists for the USFWS and State of New Jersey were reviewed to identify potential effects on federal and state listed T&E species. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. WS has consulted with the USFWS under Section 7 of the ESA concerning potential effects of BDM methods on T&E species and has obtained a Biological Opinion (B.O.). For the full context of the B.O., see Appendix F of the ADC FEIS (USDA 1997). WS also consulted with the FWS NJ Field Office under Section 7 during this EA process, to ensure that potential effects on T&E species were adequately addressed (correspondence in Appendix D).

Some members of the public are concerned that the use of registered toxicants to reduce bird damage would have adverse impacts on other wildlife species, including T&E species. Under the alternatives proposed in this EA, the primary toxicant proposed for use by WS is DRC-1339 (WS may also recommend the use of Starlicide®, a similar product), which would be used to remove cowbirds, grackles, starlings, pigeons, crows, and gulls in damage situations. Another chemical method that could be used is Avitrol®. Avitrol® is classified as an avian distressing agent and is normally used to deter target bird species from using certain problem areas. Other chemicals available for use include the tranquilizer Alpha-chloralose (for live-capturing pigeons, waterfowl and others birds), anthraquinone (Flight Control®), and methyl and di-methyl anthranilate (artificial grape flavoring, which also has bird repellent capabilities, sold commercially as ReJeX-iT®, Bird Shield®, and Goose Chase®). Appendix B contains detailed descriptions of these chemicals and their potential effects.

2.2.3 Effects on Human Health and Safety

Safety and efficacy of chemical control methods.

Some individuals may have concerns that chemicals used for wildlife damage management should not be used because of potential adverse effects on people from being exposed to the chemicals directly or to the animals that have died as a result of the chemical use. Under the alternatives proposed in this EA, one of the toxicants proposed for use by WS is DRC-1339, which would be primarily used to remove cowbirds, grackles, starlings, pigeons, crows, and gulls in damage situations. The EPA through FIFRA regulates DRC-1339 use, by NJDEP Pesticide Control Program and NJ state law (N.J.A.C. Title 7 Chapter 30 Subchapters 1-12), and by WS Directives. The chemical bird repellents methyl anthranilate (Rejex-it®, etc.) and anthraquinone (Flight Control®, etc.) could be used to reduce feeding activity on airfields and other turf areas. Both methyl anthranilate and anthraquinone are non-lethal, and work by causing a negative response to feeding in the treated area. Another chemical method that could be used is Avitrol®, which is classified as a chemical frightening agent and is normally used to avert certain bird species from using certain problem areas. The avian tranquilizer Alpha-Chloralose could be used for live-capturing pigeons, waterfowl and other birds.

The use of registered chemical toxicants and repellants for bird damage management poses no risk to public health and safety when applied according to label instructions. WS personnel who apply pesticides are certified pesticide applicators and apply pesticides according to label instructions. A detailed description of these chemicals and their potential effects is contained in Appendix B.

Impacts on human safety of non-chemical BDM methods

Some people may be concerned that WS's use of firearms, traps, and pyrotechnic scaring devices could cause injuries to people. WS personnel occasionally use traps and firearms to remove birds that are associated with damage. There is some potential fire hazard to agricultural sites and private property from pyrotechnic use.

Firearm use is a very sensitive public concern because of safety relating to the public and the threat of misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Impacts on human health and safety from birds

The concern stated here is that the absence of adequate BDM would result in adverse effects on human health and safety, because bird damage would not be curtailed or reduced to the minimum levels possible and practical. The potential impacts of not conducting such work could lead to increased incidence of injuries, illness, or loss of human lives.

2.2.4 Impacts to Stakeholders, including Aesthetics

Aesthetics is a philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is subjective in nature and is dependent on what an observer regards as beautiful. The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public is no exception, and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward these animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to reduce conflicts/problems between humans and wildlife.

There may be some concern that the proposed action or alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people.

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (e.g., reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the natural ecosystems (e.g., ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using the animal or intending to) or non-consumptive use (viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is merely knowledge that the animals exist (Decker and Goff 1987).

Many people, directly affected by problems and threats to public health or safety associated with birds, insist upon their removal from the property or public location when they cause damage. Some members of the public have an idealistic view and believe that all wildlife should be captured and relocated to another area to alleviate damage or threats to public health or safety. Others, directly affected by the problems caused by wildlife, strongly support removal. Individuals not directly affected by the harm or damage caused by wildlife may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations or sites. Those totally opposed to bird damage management want WS to teach tolerance for damage and threats to public health or safety, and that wildlife should never be killed. Some people would strongly oppose removal of birds regardless of the amount and type of damage. Some members of the public who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

The WS program in New Jersey only conducts wildlife damage management at the request of the affected property owner or resource manager. If WS received requests from an individual or official for BDM, WS would address the issues/concerns and consideration would be made to explain the reasons why the individual damage management actions would be necessary. Management actions would be carried out in a caring, humane, and professional manner.

2.2.5 Humaneness and Animal Welfare Concerns of Methods Used

Humaneness, in part, is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently.

The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if "... *the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process.*" Suffering is described as a "... *highly unpleasant emotional response usually associated with pain and distress.*" However, suffering "... *can occur without pain ...*," and "... *pain can occur without suffering ...* " (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for "... *little or no suffering where death comes immediately ...* " (CDFG 1991), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would "... *probably be causes for pain in other animals ...* " (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to considerable pain (CDFG 1991). One challenge with coping with this issue is how to achieve the least amount of animal suffering within the constraints of current technology and resources.

WS has improved the selectivity and humaneness of management techniques through research and development. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some BDM methods are used in situations where non-lethal damage management methods are not practical or effective.

New Jersey WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, and available personnel and financial resources. Mitigation measures and standard operating procedures used to maximize humaneness are described in Chapter 4.

2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.3.1 No Wildlife Damage Management at Taxpayer Expense; Wildlife Damage Management should be Fee Based

Funding for WS comes from a variety of sources in addition to federal appropriations.In New Jersey, funds to implement wildlife damage management activities and programs are derived from a number of sources, including, but not limited to Federal, state, county and municipal governments/agencies, private organizations, corporations and individuals, homeowner/property owner associations, and others, under Cooperative Service Agreements and/or other contract documents and processes. Federal, state, and local officials have decided that wildlife damage management should be conducted by appropriating funds. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Wildlife damage management is an appropriate sphere of activity for government programs, since aspects of wildlife damage management are a government responsibility and authorized and directed by law.

2.3.2 Bird Damage should be Managed by Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce bird damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer

proximity and thus could provide the service at less expense, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses and cities and towns may prefer to use WS because of security and safety issues and reduced administrative burden. Additionally, use of the pesticide DRC-1339 may be the most effective damage management method in some situations, either used alone or as part of an IWDM program. This avicide is registered only for use by WS and is not available to private nuisance wildlife control agents or property owners. However, the restricted use pesticide, Starlicide®, is similar to DRC-1339 and may be used by certified applicators.

2.3.3 Appropriateness of Preparing an EA (Instead of an EIS) for Such a Large Area

Some individuals might question whether preparing an EA for an area the size of the State of New Jersey would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing impacts for the entire State may provide a better analysis than multiple EAs covering smaller zones. In addition, the WS program in New Jersey only conducts BDM on a relatively small area of the State where damage is occurring or likely to occur.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with the Council on Environmental Quality's (CEQ's) definition (CEQ 1981).

Alternatives analyzed in detail are:

- Alternative 1: Technical Assistance Only.
- Alternative 2: Integrated Bird Damage Management Program. (Proposed Action/No Action)
- Alternative 3: Non-lethal Bird Damage Management Only By WS
- Alternative 4: No federal WS Bird Damage Management.

3.1 DESCRIPTION OF THE ALTERNATIVES

3.1.1 Alternative 1: Technical Assistance Only

This alternative would not allow for WS operational BDM in New Jersey. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, corporations, or others could conduct BDM using any legal lethal or non-lethal method available to them. Currently, DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by others would not occur legally. However, the restricted use pesticide, Starlicide®, is similar to DRC-1339 and may be used by certified applicators. Avitrol® could also be used by state certified restricted-use pesticide applicators.

3.1.2 Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) proposes to continue the current damage management program that responds to bird damage in the State of New Jersey. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce bird damage to property, agricultural resources (including livestock), natural resources, and human/public health and safety. Damage management would be conducted on public and private property in New Jersey when the resource owner (property owner) or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed as humanely as possible using shooting, trapping, and registered pesticides and other products. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or could include instances where application of lethal methods alone would be the most appropriate strategy.

3.1.3 Alternative 3: Non-lethal Bird Damage Management Only by WS

This alternative would require WS to use non-lethal methods only to resolve bird damage problems. Information on lethal BDM methods would still be available to producers and property owners through other sources such as USDA Agricultural Extension Service offices, universities, or pest control organizations. Requests for information regarding lethal management approaches would be referred to NJDFW, FWS, local animal control agencies, or private businesses or organizations. Individuals might choose to implement WS non-lethal recommendations, implement lethal methods or other methods not recommended by WS, contract for WS direct control services, use contractual services of private businesses, or take no action. Persons receiving WS's non-lethal technical and direct control assistance could still resort to lethal methods that were available to them. Currently, DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by others would be illegal. However, the restricted use pesticide, Starlicide®, is similar to DRC-1339 and may be used by certified applicators. Avitrol® could also be used by state certified restricted-use pesticide applicators.

3.1.4 Alternative 4: No Federal WS Bird Damage Management

This alternative would eliminate WS involvement in BDM in New Jersey. WS would not provide direct operational or technical assistance and requesters of WS's assistance would have to conduct their own BDM without WS input. Information on BDM methods would still be available to producers and property owners through other sources such as USDA Agricultural Extension Service offices, universities, or pest control organizations. Requests for information would be referred to NJDFW, FWS, local animal control agencies, or private businesses or organizations. Individuals might choose to conduct BDM themselves, use contractual services of private businesses, or take no action. DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal. However, the restricted use pesticide, Starlicide®, is similar to DRC-1339 and may be used by certified applicators. Avitrol® could also be used by state certified restricted-use pesticide applicators.

3.2 BDM STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN NEW JERSEY

The strategies and methodologies described below include those that could be used or recommended under Alternatives 1, 2 and 3 described above. Alternative 4 would terminate both WS technical assistance and operational BDM by WS. Appendix B is a more thorough description of the methods that could be used or recommended by WS.

3.2.1 Integrated Wildlife Damage Management (IWDM)

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement the best combination of effective management methods in the most cost-effective[2] manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM may incorporate cultural practices (e.g., animal husbandry), habitat modification (e.g., exclusion), animal behavior modification (e.g., scaring), removal of individual offending animals, local population reduction, or any combination of these, depending on the circumstances of the specific damage problem.

3.2.2 The IWDM Strategies Employed by WS

Technical Assistance Recommendations
"Technical assistance" as used herein is information, demonstrations, and advice on available and

[2] The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

appropriate wildlife damage management methods and approaches. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for use by non-WS entities. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and the practicality of their application. In some instances, wildlife-related information provided to the requestor by WS results in tolerance/acceptance of the situation. In other instances, management options are discussed and recommended.

Under APHIS NEPA implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving bird damage problems.

Direct Damage Management Assistance (Direct Control)
Direct damage management assistance includes damage management activities that are directly conducted or supervised by WS personnel. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and when *Agreements for Control* or other comparable instruments are provided for direct damage management by WS. The initial investigation defines the nature, history, and extent of the problem; species responsible for the damage; and methods available to resolve the problem. The professional skills of WS personnel are often required to effectively resolve problems, especially if restricted use pesticides are necessary or if the problems are complex.

Educational Efforts
Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

Research and Development
The National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC research was instrumental in the development of methyl anthranilate. In addition, NWRC is currently testing new experimental drugs that inhibit bird reproduction. NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

3.2.2.1 Examples of WS Direct Operational and Technical Assistance in BDM in New Jersey

- The Federal Aviation Administration (FAA) and the South Jersey Transportation Administration (SJTA) entered into Interagency Agreements and Cooperative Service Agreements with NJ WS for the purpose of assessing, managing, and monitoring bird-related public safety and aviation hazards at the Atlantic City International Airport (ACY). Bird-aircraft strikes and hazards involving laughing gulls, other gulls, blackbirds, vultures, meadowlarks, horned larks, killdeer, kestrels and other raptors have created safety hazards at the airport. Since 1988, WS implemented an IWDM approach, consisting of technical assistance and direct control components: WS review of airport development and landscaping plans, habitat management recommendations, threatened

and endangered species monitoring, hazardous bird species population management (shooting and trapping), and exclusion. WS involvement at ACY has considerably reduced strikes with hazardous bird species at the airport.

- The City of Bridgeton contracted with NJ WS for management of a crow roost causing property damage and posing potential human health and safety problems. WS used an IWDM approach to alleviate the problem. Similarly, the NJ DEP requested WS technical assistance and demonstration of crow harassment tools (pyrotechnics, lasers) and techniques to reduce crow damage to a historical cemetery in Trenton, NJ. After WS involvement, NJDEP personnel have conducted an annual crow roost dispersal program to protect the cemetery and reduce human health concerns associated with bird droppings at a nearby NJDEP office complex.

- A Hunterdon County dairy farmer requested WS assistance in reducing agricultural losses to "blackbirds". European starlings, common grackles, brown-headed cowbirds, pigeons, and other "blackbirds" were consuming cattle feed, contaminating feed with droppings, and damaging property (nest-building in equipment and buildings, accumulations of feces on equipment). Implementation of an IWDM program by NJ WS, consisting of recommendations of cultural practice and habitat modifications, harassment, population reduction (trapping, shooting, use of DRC-1339) resulted in reduction of the blackbird populations present on the dairy farm, and reduced damage and loss of dairy feed to a tolerable level.

- The Borough of Scotch Plains, NJ entered into Cooperative Service Field Agreements with NJ WS to reduce a suburban starling/grackle roost that was creating nuisance and human health problems. WS implementation of an IWDM program, consisting of harassment with pyrotechnics and recommendations to reduce bird perching habitat was effective in reducing the number of birds roosting on the site for several weeks.

- During March-July, WS receives requests for help from private citizens in NJ who are experiencing safety problems due to nesting birds' (typically, catbirds, mockingbirds, blue jays) dive bombing behaviors around homes and other buildings. Human injury and quality of life impacts result from this situation. WS provides advice regarding use of alternate entrances, awareness, life history information of the bird species, habitat modification recommendations, and is available to remove nests and individual birds.

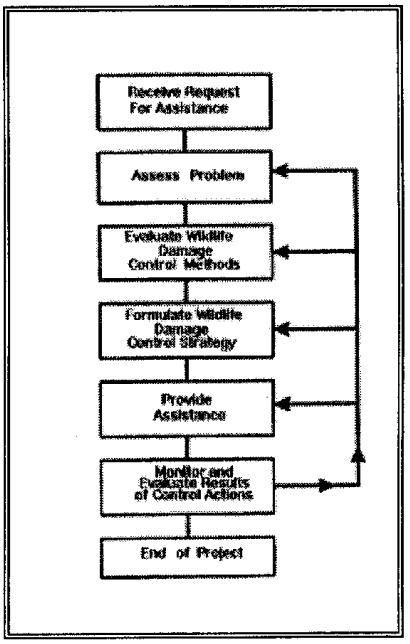
- In May, 1997, WS biologists captured 19 domestic ducks and geese at a public park in Somerset County, NJ, pursuant to a Cooperative Service Field Agreement with the Somerset County Park System, in order to reduce accumulations of feces and overgrazing of park landscaping. The domestic fowl were collected through use of alpha chloralose, and were released to individuals conducting projects with the local 4H organization. Birds that were collected included pilgrim geese, embden geese, pekins, Rouen, and khaki campbells.

3.2.3 WS Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints which is depicted by the WS Decision Model and described by Slate et al. in 1992 (Figure 3-1). WS personnel are frequently contacted after requesters have tried or considered non-lethal methods and found them to be impractical, too costly, or inadequate for effectively reducing damage. WS personnel assess the problem then evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic and social considerations. Following this evaluation, methods deemed to be practical for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and

monitoring the results of the damage management strategy. The Decision Model is not a written documented process, but a mental problem-solving process common to most, if not all, professions.

Figure 3-1
WS Decision Model



3.2.4 Bird Damage Management Methods Available for Use (See Appendix B)

3.2.4.1 Non-chemical, Non-lethal Methods

Agricultural producer and property owner practices consist primarily of non-lethal preventive methods such as cultural methods[3] and habitat modification.

Animal behavior modification refers to tactics that alter the behavior of birds to reduce damage. Some but not all of these tactics include the following:

- Exclusions, such as netting
- Propane exploders (to scare birds)
- Pyrotechnics (to scare birds)
- Distress calls and sound producing devices (to scare birds)
- Visual repellents and other scaring tactics
- Lasers (to scare birds)

Nest destruction of the target species before eggs or young are in the nest.

Egg addling/oiling/destruction is the practice of destroying the embryo in the egg prior to hatching; physically breaking eggs; or directly removing eggs from a nest and destroying them.

Habitat/environmental modification to attract or repel certain bird species.

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[3] Generally involves modifications to the management of protected resources to reduce their vulnerability to wildlife damage.

Live traps are various types of traps designed to capture birds alive. Some examples are clover traps, decoy traps, nest box traps, mist nets, cannon nets, etc. Captured target birds can then be euthanized.

Lure crops/alternate foods are crops planted or other food resources provided to mitigate the potential loss of higher value crops.

3.2.4.2 Chemical, Non-lethal Methods (See Appendix B for detailed descriptions)

Avitrol® is a chemical frightening agent registered for use on pigeons, crows, gulls, blackbirds, starlings, and English sparrows in various situations. This chemical works by causing distress behavior in the birds that consume treated baits from a mixture of treated and untreated bait. These distress calls then generally frighten the other birds from the site. In most cases, those birds that consume the treated bait will die (Johnson and Glahn 1994).

Alpha-chloralose, a central nervous system depressant, is used as an immobilizing agent to capture pigeons, waterfowl (including domestic ducks and geese) or other birds. It is generally used in recreational and residential areas, such as near swimming pools, shoreline residential areas, golf courses, or resorts. Alpha- chloralose is typically delivered as a well-contained bait in small quantities with minimal hazards to pets and humans;bread or corn baits are fed directly to the target birds.

Tactile repellents reportedly deter birds from roosting, perching, or nesting on certain structural surfaces by creating a tacky or sticky surface that the birds avoid.

Methyl Anthranilate (MA) and **Di-methyl Anthranilate** (artificial grape flavoring food additive) has been shown to be an effective repellent for many bird species. It can be applied to turf or surface water or as a fog to repel birds from small areas. It may also become available for use as a livestock feed additive that has bird repellent value.

Other repellents: Other available bird repellents include anthraquinone (Avery et al. 1997) and particulate feed additives, such as charcoal particles (e.g., adhered to livestock feed).

3.2.4.3 Mechanical, Lethal Methods

Snap traps are considered quick-kill traps. They are modified rat traps that are used to remove individual birds causing damage to buildings.

Shooting is more effective as a dispersal technique than as a way to reduce bird numbers. The number that can be killed by shooting is generally very small in relation to the number involved in damage situations. Usually only a few dozen birds can be shot from individual flocks that can number anywhere from a few hundred to many thousands or hundreds of thousands of birds before the rest of the birds become gun shy. Shooting, however, can be helpful in some situations to supplement and reinforce other dispersal techniques. It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with firearms is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible.

Sport hunting can be part of a BDM strategy, and is recommended by WS to enhance the effectiveness of harassment techniques.

Cervical dislocation is approved by the American Veterinary Medical Association (AVMA, Beaver et al. 2001) and may be used to euthanize birds which are captured in live traps.

3.2.4.4 Chemical, Lethal Methods

Avitrol® is a chemical frightening agent (repellent) that is employed as a nonlethal harassment method, and although a small percentage of birds that are present are killed, it is described in Section 3.2.4.2 (Chemical, Non-lethal Methods) and Appendix B.

DRC-1339 is a slow-acting avicide for reducing damage from several species of birds, including cowbirds, grackles, starlings, pigeons, crows, and gulls. DRC-1339 is highly toxic to sensitive species, but only slightly toxic to non-sensitive birds, predatory birds and mammals. This chemical would be the primary lethal chemical method used for bird damage management under the proposed program.

Starlicide® (3-chloro-p-toluidine hydrochloride) is a restricted use pesticide that is formulated as a 0.1% ready-to-use product and is commercially available to certified applicators or persons under their supervision. This avicide may be recommended or used by WS to control European starlings, crows, pigeons, cowbirds, grackles, and certain gull species. Starlicide® may be used in feedlots, around buildings and fenced non-crop areas, bird staging and roosting areas, federal and state wildlife refuges, and other sites (EPA 1995). Starlicide® is similar to DRC-1339 used in feedlots; however, it contains 0.1% DRC-1339 (USDA 1997, Appendix P). Therefore, the properties of this product are similar to DRC-1339.

Carbon dioxide (CO_2) gas is an AVMA-approved euthanasia method (Beaver et al. 2001) which is sometimes used to euthanize birds that have been chemically immobilized or captured in live traps. Live birds are placed in a container or chamber into which CO_2 gas is released. The birds quickly expire after inhaling the CO_2.

3.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered, but not analyzed in detail. These were:

3.3.1 Lethal Bird Damage Management Only By WS

Under this alternative, WS would not conduct any non-lethal control of birds for BDM purposes in the State, but would only conduct lethal BDM. This alternative was eliminated from further analysis because some bird damage problems can be resolved effectively through non-lethal means. Additionally, lethal methods may not always be available for use due to safety concerns or local ordinances prohibiting the use of some lethal methods, such as the discharge of firearms. For example, a number of damage problems involving the encroachment of injurious birds into buildings can be resolved by installing barriers or repairing of structural damage to the buildings, thus excluding the birds. Further, damage situations such as large flocks of injurious birds on/near airport runways could not be alleviated immediately by lethal means, while scaring them away using various harassment devices might resolve the threat to passenger safety at once.

3.3.2 Compensation for Bird Damage Losses

The compensation alternative would require the establishment of a system to reimburse persons impacted by bird damage. This alternative was eliminated from further analysis because no federal or state laws currently exist to authorize such action. Under such an alternative, WS would not provide any direct control or technical assistance. Aside from lack of legal authority, analysis of this alternative in the ADC Final EIS indicated that the concept has many drawbacks (USDA 1997):

- It would require larger expenditures of money and labor to investigate and validate all damage claims to determine and administer appropriate compensation.

- Compensation would most likely be less than full market value. Responding in a timely fashion to all requests to assess and confirm damage would be difficult and certain types of damage could not be conclusively verified. For example, proving conclusively in individual situations that birds were responsible for disease outbreaks would be impossible, even though they may actually have been responsible. Thus, a compensation program that requires verification would not meet its objective for mitigating such losses.

- Compensation would give little incentive to resource owners to limit damage through improved cultural, husbandry, or other practices and management strategies.

- Not all resource owners would rely completely on a compensation program and unregulated lethal control would most likely continue as permitted by state law.

- Compensation would not be practical for reducing threats to human health and safety.

3.3.3 Use of Bird-proof Feeders in Lieu of Lethal Control at Dairies and Cattle Feeding Facilities

Bird-proof feeders were proposed by Animal Protection of New Mexico (APNM), Inc. as a method for excluding birds at dairies and cattle feeding facilities in that State. This method would involve the installation of 1/8" thick steel panel feed troughs, covered by parallel 4-6 inch spaced steel cables or wires running from the outer top edge of the trough up at a 30-45 degree angle to the top of the head chutes that cattle use to access the feed. Vertical canvas strips would be hung from the cables. The feeder was reportedly designed for use with horses. A copy of a diagram of this system was sent to Mr. Jim Glahn, Bird Control Research Biologist at the WS-National Wildlife Research Center (NWRC), who has nearly 12 years of experience researching problems caused by European starlings at livestock feeding operations. He found the following:

- A major flaw in the design is the spacing of the cables at 4-6" which would allow European starlings to drop through. Reducing the spacing to 2" as recommended by Johnson and Glahn (1994) would likely interfere with the delivery of feed to the troughs. Interference would occur because the feed mixture currently used by most dairies is a mixture of chopped alfalfa hay and corn silage with a grain component. The alfalfa/corn silage portion would likely hang up on the cable or wire strands of the troughs and much would fall outside the troughs, with increased feed waste a result (Twedt and Glahn 1982).

- the spacing of the canvas strips is not specified, and canvas would deteriorate quickly from cattle licking and weather (Twedt and Glahn 1982).

Mr. Glahn expressed the opinion, based on Twedt and Glahn (1982) and Feare (1984), that exclusion methods to reduce starling depredations at livestock feeding operations are usually the least cost-effective solution. Despite the above concerns about the bird-proof feeder system recommended by APNM, Inc., similar types of systems could be recommended by WS under the current program should any become available that are effective, practical, and economically feasible for producers to implement.

3.4 MITIGATION AND STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

3.4.1 Mitigation in Standard Operating Procedures (SOPs)

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. The current WS program, nationwide and in New Jersey, uses such mitigation measures and these are discussed in detail in Chapter 5 of the ADC Final EIS (USDA

1997). Some key mitigating measures pertinent to the proposed action and alternatives of this EA that are also incorporated into WS SOPs include:

- The WS Decision Model thought process which is used to identify effective wildlife damage management strategies and their effects.

- Reasonable and prudent measures or alternatives are identified through consultation with the USFWS and are implemented to avoid effects to T&E species.

- EPA-approved label directions are followed for all pesticide use. The registration process for chemical pesticides is intended to assure minimal adverse effects to the environment when chemicals are used in accordance with label directions.

- All WS Specialists in New Jersey using restricted chemicals are trained and certified by, or operate under the direct supervision of, program personnel or others who are experts in the safe and effective use of chemical BDM materials.

- The presence of non-target species is monitored before using DRC-1339 (or Starlicide®) to reduce the risk of mortality of non-target species populations.

- Research is being conducted to improve BDM methods and strategies so as to increase selectivity for target species, to develop effective non-lethal control methods, and to evaluate non-target hazards and environmental effects.

3.4.2 Additional Mitigation Specific to the Issues

The following is a summary of additional mitigation measures that are specific to the issues listed in Chapter 2 of this document.

- Management actions would be directed toward localized populations or groups of target species and/or individual offending members of those species. Generalized population suppression across the State, or even across major portions of the State, would not be conducted.

- WS uses BDM devices and conducts activities for which the risk of hazards to public safety and hazard to the environment have been determined to be low according to a formal risk assessment (USDA 1997, Appendix P). Where such activities are conducted on private lands or other lands of restricted public access, the risk of hazards to the public is even further reduced.

- WS personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding non-target take.

- Observations of birds feeding at feedlots, dairies, or staging areas; or observations of birds that are associated with bird concentrations are made to determine if non-target or T&E species would be at risk from BDM activities.

- WS has consulted with the USFWS regarding potential effects of control methods on T&E species and abides by reasonable and prudent alternatives (RPAs) and/or reasonable and prudent measures (RPMs) established as a result of that consultation. For the full context of the Biological Opinion, see the ADC Final EIS, Appendix F (USDA 1997).

- WS has consulted with the NJDFW Endangered and Nongame Species Program regarding potential effects of bird damage management control methods on State-listed T&E species.

- WS uses chemical methods for BDM that have undergone rigorous research to prove their safety and lack of serious effects on non-target animals and the environment.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. This section analyzes the environmental consequences of each alternative in comparison with the no action alternative to determine if the real or potential effects would be greater, lesser, or the same.

The following resource values within the State are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Cumulative effects are discussed in relationship to each of the alternatives analyzed, with emphasis on potential cumulative effects from methods employed, and including summary analyses of potential cumulative impacts to target and non-target species, including T&E species.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

Effects on sites or resources protected under the National Historic Preservation Act: WS BDM actions are not undertakings that could adversely affect historic resources (See Section 1.1.8).

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

4.1.1 Effects on Target Bird Species Populations

4.1.1.1 Alternative 1: Technical Assistance Only

Under this alternative, WS would have no impact on target bird populations in the State because the program would not provide any operational BDM activities. The program would be limited to providing advice only. Private efforts to reduce or prevent bird damage and perceived disease transmission risks could increase, which could result in similar or even greater effects on those populations than the Proposed Action. However, for the same reasons shown below in the population effects analysis in section 4.1.1.2, it is unlikely that target bird populations would be adversely impacted by implementation of this alternative. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations. DRC-1339 and the tranquilizer alpha-chloralose are currently only available for use by WS employees and would not be available for use under this alternative.

4.1.1.2 Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

Analysis of this issue is limited to those species killed during WS BDM. The analysis for magnitude of impact generally follows the process described in Chapter 4 of USDA (1997). Magnitude is described in USDA (1997) as "*. . . a measure of the number of animals killed in relation to their abundance.*" Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management on species whose population

densities are high and usually only after they have caused damage. Tables 4-1 and 4-2 identify the number of birds and nests taken and the number of birds harassed by WS during FY2000-FY2002.

Table 4-1. Birds lethally removed and nests/eggs removed by WS for Bird Damage Management during FY 2000 through FY 2002 in New Jersey.

Species	Blackbird/ Starling Trap	Shooting	DRC 1339	Nests (eggs) Removed/ Treated
Red-winged Blackbird	1	21	8	0
European Starling	30	46	0	0
American Crow	0	38	0	0
Turkey Vulture	0	10	0	0
Killdeer	0	7	0	0
Mourning Dove	0	17	0	0
Snow Goose	0	1	0	0
Mallard	0	0	0	0
Herring Gull	0	1	0	0
Laughing Gull	0	147	0	0
Pigeon	0	2	0	0
Domestic Waterfowl	0	0	0	0

Table 4-2. Number of birds harassed by WS for Bird Damage Management activities during FY 2000 through FY 2002 in New Jersey.

Species	FY 2000	FY 2001	FY 2002	2000-02
Red-winged Blackbirds	372	53	177	602
Mixed Blackbird Group	42	0	0	42
European Starlings	2121	1200	816	4137
Brown-headed Cowbirds	50	0	30	80
Common Grackles	0	60	0	60
American Crows	579	680	741	2000
Turkey Vultures	24	64	329	417
Black Vultures	0	10	50	60
Red-tailed Hawks	32	85	53	170
Northern Harrier	142	182	63	387
Hawks, other species	0	50	7	57
American Kestrel	25	85	24	134
Falcon	0	0	1	1
Owls	5	0	0	5
Eastern Meadowlark	25	68	8	101
Killdeer	0	59	43	102
Barn Swallow	10	0	0	10
Tree Swallow	25	117	16	158
Mourning Dove	60	213	393	666
Horned Lark	0	0	6	6
Great Egret	1	0	0	1
Great Blue Heron	1	1	2	4
Shorebirds	0	0	6	6
Plovers	150	22	190	362

Terns	0	2	0	2
Herring Gulls	266	17	14	297
Laughing Gulls	360	1096	2500	3956
Great Black-backed Gull	27	0	1	28
Ring-billed Gull	56	22	18	96
Mallard	9	14	8	31
Other Ducks	7	0	0	7
Total	4,389	4,100	5,496	13,985

Breeding Bird Surveys. Bird populations can be monitored by using data from the Breeding Bird Surveys (BBS). The BBS is a large-scale inventory of North American birds coordinated by the U.S. Geological Survey, Patuxent Wildlife Research Center (Sauer et al 2003). The BBS is a combined set of over 3,700 roadside survey routes primarily covering the continental United States and southern Canada. The BBS was started in 1966, and routes are surveyed in June by experienced birders. The stated primary objective of the BBS has been to generate an estimate of population change for all breeding birds. Populations of birds tend to fluctuate, especially locally, as a result of variable annual local habitat and climatic conditions. Trends can be determined using different population equations, and statistically tested to determine if a trend is significant. The significance of a trend's "change" is reflected in the calculated P-value (probability) for that species.

The BBS data is best used to monitor population trends. However, the average number of birds per route (relative abundance) can be used to theoretically estimate the population size (relative abundance/10 mi^2 x 8,215 (total land/water area in New Jersey)). To use these population estimates the following assumptions would need to be accepted.

1. All birds within a quarter mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a quarter mile in radius at all stops due to obstructions such as hills, trees, and brush and because some bird species can be very elusive. Therefore, the number of birds seen per route would provide a conservative estimate of the population.
2. The chosen survey routes are totally random and are fully representative of available habitats. When BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a half-mile apart. Therefore, if survey areas had stops with excellent food availability, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated.
3. Birds are equally distributed throughout the survey area and routes were randomly selected. Routes are randomly picked throughout the State, but are placed on the nearest available road. Therefore, the starting point is picked for accessibility by vehicle. However a variety of habitat types are typically covered since most BBS routes are selected because they are "off the beaten path" to allow observers to hear birds without interruption from vehicular noise.

Christmas Bird Counts. The National Audubon Society (NAS) conducts nationwide bird surveys in December to early January (the NAS Christmas Counts). The Christmas Bird Counts (CBC) reflect the number of birds frequenting the state during the winter months. The CBC data does not provide a population estimate, but can be used as an indicator of trends in the population. Researchers have found that population trends reflected in CBC data tend to correlate well with those from censuses taken by more stringent means (National Audubon Society 2002).

European Starlings

Colonization of North America by the European Starling began on March 6, 1890 when a Mr. Eugene Scheifflin, a member of the Acclimatization Society, released 80 starlings into New York's Central Park. Starlings occurred in Plainfield, NJ in 1900 (Leck 1984) , and extended southward so that by the 1930's, starlings were one of the most abundant birds in southern NJ (Walsh et al. 1999). The birds thrived and exploited their new habitat. By 1918, the advance line of migrant juveniles extended from Ohio to Alabama; by 1926 from Illinois to Texas; by 1941 from Idaho to New Mexico; and by 1946 to California and Canadian coasts (Miller 1975). In just 50 short years the starling had colonized the United States and expanded into Canada and Mexico and 80 years after the initial introduction had become one of the most common birds in North America (Feare 1984). However, because starlings are an introduced rather than a native species, they are not protected by federal law, nor are they protected by New Jersey state law.

Precise counts of starling populations do not exist but one estimate placed the nationwide starling population at an estimated 140 million birds (Johnson and Glahn 1994). More recent estimates place the nationwide population at 200 million (Walsh et al. 1999). Natural mortality in starling populations is between 50% and 65% of the population each year, regardless of human-caused control operations (USDA 1997). Therefore the estimated natural mortality of starlings in the U.S should be between 70 and 91million birds annually. Based upon an anticipated increase in requests for services, WS's lethal management of starlings in New Jersey would be expected to be no more than approximately 1.5% of the total natural mortality in any one year under the Proposed Action.

Breeding Bird Survey trend data from 1966-2002 indicate that European starling populations have decreased at an annual rate of -1.7%, -0.6%, and -0.9% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 110.60, a total New Jersey summer starling population could be estimated at approximately 90,900 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of starlings throughout the state (National Audubon Society 2002). In NJ, starlings are one of the most widespread bird species, nesting in more than 95% of the surveyed blocks, and were absent only in the Pine Barrens in areas of large unbroken forest tracts (Walsh et al. 1999).

Starlings are non-indigenous and often have negative impacts on and compete with native birds. They typically have two broods between early April and mid-June (Leck 1984). Starlings gather in large flocks after the breeding season, and large roosts in NJ urban/suburban areas pose problems for homeowners and others. Starlings are considered by many wildlife biologists and ornithologists to be an undesirable component of North American ecosystems. Any reduction in starling populations in North America, even to the extent of complete eradication, could be considered a beneficial impact to native bird species. In NJ, competition with starlings may negatively effect woodpeckers, great crested flycatchers, tree swallows, purple martins, and eastern bluebirds (Walsh et al. 1999).

Based on the above information and WS limited lethal take of starlings in New Jersey, WS should have minimal effects on local, statewide, regional or continental starling populations.

Red-winged Blackbirds, Common Grackles and Brown-headed Cowbirds

Red-winged blackbirds, common grackles and brown-headed cowbirds are considered to be part of the blackbird species group described in USDA (1997) and are estimated to represent 38%, 22% and 18% of this group, respectively (Meanley and Royall 1976).

The red-winged blackbird is by far the most common member of the blackbird group, and its range extends from Canada to the West Indies and Costa Rica (Peterson 1980). This species is a

common and widely distributed breeding bird in NJ (Walsh et al. 1999), and are abundant in marshes, fields, and woods, where they consume insects, small fruits, wild seeds, grain, and small aquatic life (Peterson 1980). In NJ, red-winged blackbirds nest in a variety of fresh and saltwater wetland habitats, and some upland habitats, including pastures and fields (Walsh et al. 1999). Clutch size ranges from three to five eggs (Bull and Farrand 1977).

The brown-headed cowbird is the smallest member of the blackbird group. It is common throughout the United States and often is found near livestock, and in flocks of mixed blackbird species. This bird inhabits agricultural land, fields, woodland edges, and suburban areas (Bull and Farrand 1977). The preferred food of brown-headed cowbird includes: insects, small fruits, wild seeds, grain, and small aquatic life (Peterson 1980). It is a social parasite that often lays its eggs in the nests of rarer bird species. In NJ, common host species are song sparrow, common yellowthroat, yellow warbler, and red-eyed vireo (Walsh et al. 1999).

The common grackle occupies a range that includes Canada and the United States east of the Rockies (Peterson 1980). It is the second-most broadly distributed nesting bird species in NJ (Walsh et al. 1999). This bird inhabits croplands, fields, parks, lawns, and open woodland (Bull and Farrand 1977). The grackle has an extremely varied diet, which includes insects, crayfish, frogs, other small aquatic life, mice, nestling birds, eggs, sprouting and ripened grains, seeds, and fruits (Bull and Farrand 1997; Peterson 1980). These birds form large flocks during migration and in winter roosts and often form breeding colonies. Common grackles usually nest in tall evergreens and have clutch size of five eggs.

Precise counts of blackbird populations do not exist, but one estimate placed the United States summer population of the blackbird group at over 1 billion (USDA 1997) and the winter population at 500 million (Royall 1977). Natural mortality in blackbird populations is between 50% and 65% of the population each year, regardless of human-caused control operations (USDA 1997). The annual population of blackbirds in the eastern U.S. is at least 232 million (Meanley and Royall 1976, Johnson and Glahn 1994). Therefore the estimated natural mortality of the blackbird group in the eastern U.S should be between 116 and 140 million birds annually. Based upon an anticipated increase in requests for services, WS's lethal management of red-winged blackbirds, brown-headed cowbirds and common grackles in New Jersey would be expected to be no more than approximately 2% of the total natural mortality in any one year under the Proposed Action.

Dolbeer et al. (1995) showed that WS kills of 3.6% of the wintering population had no effect on breeding populations the following spring. Dolbeer et al. (1976) constructed a population model which indicated that a reduction of 14.8% of the wintering blackbird population would reduce the spring breeding population by 20% and that a 56.2% reduction in the wintering blackbird population would reduce spring breeding populations by only 33%. Given the density-dependent relationships in a blackbird population (i.e. decreased mortality and increased fecundity of surviving birds) a much higher number would likely have to be killed in order to impact the regional breeding population.

Breeding Bird Survey trend data from 1966-2002 indicate that red-winged blackbird populations have decreased at an annual rate of -0.8%, -0.9%, and -1.7% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 31.34, a total New Jersey summer red-winged blackbird population could be estimated at approximately 25,700 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of red-winged blackbirds throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Breeding Bird Survey trend data from 1966-2002 indicate that brown headed cowbird populations have increased at an annual rate of 0.8% throughout New Jersey and decreased at an annual rate of -0.9%, and -1.9% throughout the United States and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 6.40, a total New Jersey summer cowbird population could be estimated at approximately 5,300 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of cowbirds throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Breeding Bird Survey trend data from 1966-2002 indicate that common grackle populations have decreased at an annual rate of -1.3%, -1.4%, and -1.4% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 105.27, a total New Jersey summer grackle population could be estimated at approximately 86,500 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of grackles throughout the state (National Audubon Society 2002). The NJDFW considers the population trend for this species to be stable (NJDFW 2003).

The USFWS has established a Depredation Order (50 CFR 21.43) for blackbirds, whereby no Federal permit is required to remove blackbirds if they are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on blackbird populations would have no significant adverse impact on the quality of the human environment.

Based on the above information and WS anticipated lethal take of red-winged blackbirds, brown-headed cowbirds and common grackles in New Jersey, WS should have minimal effects on local, statewide, regional or continental populations.

Feral Domestic Pigeons

Domestic pigeons, or rock doves, are a non-indigenous species that were first introduced into the United States by European settlers as a domestic bird to be used for sport, carrying messages, and as a source of food (USFWS 1981). Many of these birds escaped and eventually formed the feral pigeon populations that are now found throughout the United States, southern Canada, and Mexico (Williams and Corrigan 1994). However, because pigeons are an introduced rather than a native species, they are not protected by federal law or New Jersey state law.

Pigeons are highly dependent on humans to provide them with food and sites for roosting, loafing, and nesting (Williams and Corrigan 1994), and their nesting is usually associated with man-made structures, particularly bridges and building ledges (Walsh et al. 1999). Thus, they are commonly found around city buildings, bridges, parks, farm yards, grain elevators, feed mills, and other manmade structures (Williams and Corrigan 1994). Additionally, although pigeons are primarily grain and seed eaters, they will readily feed on garbage, livestock manure, spilled grains, insects, and any other available bits of food (Williams and Corrigan 1994).

Breeding Bird Survey trend data from 1966-2002 indicate that pigeon populations have decreased at an annual rate of -2.7% throughout New Jersey, are stable (0.0%) throughout the United States and have increased at an annual rate of 0.1% throughout the eastern region (Sauer et al. 2003). With a relative abundance of 15.95, a total New Jersey summer pigeon population could be estimated at approximately 13,100 birds. New Jersey Christmas Bird Count data from 1966-2002 shows an increasing population trend for wintering populations of pigeons throughout the state (National Audubon Society 2002). Statewide, the number of pigeons tallied in the CBC has

increased from a low point in the 1970's, to between 20,000 and 25,000 birds between 1990 and 1997 (Walsh et al. 1999).

Any BDM involving lethal control actions by WS for this species would be restricted to isolated, individual sites, or communities. In those cases where feral domestic pigeons are causing damage or are a nuisance, complete removal of the local population could be achieved. This would be considered to be a beneficial impact on the human environment since the affected property owner or administrator would request it. Although regional population impacts would be minor, even if significant regional or nationwide reductions could be achieved, this would not be considered an adverse impact on the human environment because the species is not part of native ecosystems. However, some individuals who experience aesthetic enjoyment of pigeons may consider major population reduction in some localities a negative impact.

Based upon an anticipated increase in requests for services, WS's lethal management of pigeons in New Jersey would be expected to be no more than approximately 1,000 pigeons in any one year under the Proposed Action. In addition WS may remove up to 1,000 pigeon nests on an annual basis. Based on the above information and WS limited lethal take of pigeons in New Jersey, WS should have minimal effects on local, statewide, regional or continental pigeon populations.

English Sparrows

English sparrows, or house sparrows, were introduced to North America from England in 1850 and have spread throughout the continent (Fitzwater 1994). Since its first NJ appearance in Chatham, NJ in 1868, the house sparrow has become a common and broadly distributed breeding bird in the state (Walsh et al. 1999). Like European starlings and pigeons, because of their negative effects on and competition with native bird species, English sparrows are considered by many wildlife biologists, ornithologists, and naturalists to be an undesirable component of North American ecosystems. English sparrows are found in nearly every habitat except dense forest, alpine, and desert environments. They prefer human-altered habitats, and are abundant on farms and in cities and suburbs (Robbins et al. 1973). However, because English sparrows are an introduced rather than a native species, they are not protected by federal law, nor are they protected by New Jersey state law.

Breeding Bird Survey trend data from 1966-2002 indicate that English sparrow populations have decreased at an annual rate of -3.7%, -2.5%, and -2.7% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 32.86, a total New Jersey summer sparrow population could be estimated at approximately 27,000 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of sparrows throughout the state (National Audubon Society 2002). CBC data from 1987-97, show the number of English sparrows counted was relatively constant around 13,000 birds (Walsh et al. 1999).

The change in farming practices may have been a factor for their recent population decline. The considerable decline in small farms and associated disappearance of a multitude of small feed lots, stables and barns, may have reduced English sparrow populations, as these sites were a primary source of food in the early part of the 20th century. Ehrlich et al. (1988) suggested that English sparrow population declines might be linked to the dramatic decrease during the 20th century in the presence of horses as transport animals. Grain rich horse droppings were apparently a major food source for this species.

Any BDM involving lethal control actions by WS for this species would be restricted to isolated, individual sites, or communities. In those cases where sparrows are causing damage or are a nuisance, complete removal of the local population could be achieved. This would be considered to be a beneficial impact on the human environment since the affected property owner or

administrator would request it. Although regional population impacts would be minor, even if significant regional or nationwide reductions could be achieved, this would not be considered an adverse impact on the human environment because the species is not part of native ecosystems. However, some individuals who experience aesthetic enjoyment of sparrows may consider major population reduction in some localities a negative impact.

Based upon an anticipated increase in requests for services, WS's lethal management of English sparrows in New Jersey would be expected to be no more than approximately 1,000 sparrows in any one year under the Proposed Action. In addition WS may remove up to 1,000 sparrow nests on an annual basis. Based on the above information and WS limited lethal take of English sparrows in New Jersey, WS should have minimal effects on local, statewide, regional or continental sparrow populations.

Turkey Vultures

Turkey vultures nest on the ground in thickets, stumps, hollow logs, or abandoned buildings (Walsh et al. 1999). Turkey vultures occur in all of Mexico, most of the United States, and in the southern tier of Canada (Wilbur 1983, Rabenhold and Decker 1989). Northern populations of turkey vultures migrate from summer to more southern wintering areas (Stewart 1977). Turkey vultures have been reported to live to 16 years of age (Henny 1990).

Breeding Bird Survey trend data from 1966-2002 indicate that turkey vulture populations have increased at an annual rate of 4.9%, 1.4%, and 3.4% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 2.72, a total New Jersey summer turkey vulture population could be estimated at approximately 2,235 birds. New Jersey Christmas Bird Count data from 1966-2002 shows an increasing population trend for wintering populations of turkey vultures throughout the state (National Audubon Society 2002). The number of turkey vultures counted during CBCs in NJ has risen dramatically from fewer than 200 in the mid-1970's to more than 2000 in the mid-1990's (Walsh et al. 1999). They are a common breeding bird throughout most of NJ (Walsh et al. 1999). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Turkey vultures are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, vultures are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on turkey vulture populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued six (6) depredation permits to NJ entities. These permits authorized the take of 75 turkey vultures by individuals, corporations and others to protect human health and safety and property.

In wildlife damage management situations, turkey vultures are taken to re-enforce non-lethal BDM methods and to reduce turkey vulture populations in site specific areas only when needed to reduce damage; only a minimal number of turkey vultures are removed from a given area. Based upon an anticipated increase in requests for services, WS's lethal management of turkey vultures in New Jersey would be expected to be no more than approximately 75 vultures in any one year under the Proposed Action. In addition WS may remove up to 20 turkey vulture nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of vultures in New Jersey, WS should have minimal effects on local, statewide, regional or continental turkey vulture populations.

Black Vultures

Historically in North America, black vultures occur in the southeastern United States, Texas, Mexico, and parts of Arizona (Wilbur 1983). Black vultures have been expanding their range northward in the eastern United States (Wilbur 1983, Rabenhold and Decker 1989). Black vultures are considered locally resident (Parmalee and Parmalee 1967, Raben and Decker 1989), however some populations will migrate (Eisenmann 1963 cited from Wilbur 1983). Black vultures have been reported to live to 25 years of age (Henny 1990).

Breeding Bird Survey trend data from 1966-2002 indicate that black vulture populations have increased at an annual rate of 23.7%, 3.1%, and 2.8% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of .10, a total New Jersey summer black vulture population could be estimated at approximately 82 birds. New Jersey Christmas Bird Count data from 1966-2002 shows an increasing population trend for wintering populations of black vultures throughout the state (National Audubon Society 2002). Since 1981 when the first black vulture nest was identified in NJ (in Hunterdon County), the species has rapidly colonized the state to the point where they are present year-round in most areas (Walsh et al 1999). Black vulture roosts occur in several local areas of NJ during autumn-winter. In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Black vultures are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, vultures are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on black vulture populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued six (6) depredation permits to NJ entities. These permits authorized the take of 70 black vultures by individuals, corporations, and others to protect human health and safety and property.

In wildlife damage management situations, black vultures are taken to re-enforce non-lethal BDM methods and to reduce black vulture populations in site specific areas only when needed to reduce damage; only a minimal number of vultures are removed from a given area. Based upon an anticipated increase in requests for services, WS's lethal management of black vultures in New Jersey would be expected to be no more than approximately 75 vultures in any one year under the Proposed Action. In addition WS may remove up to 20 black vulture nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of vultures in New Jersey, WS should have minimal effects on local, statewide, regional or continental black vulture populations.

Killdeer

The killdeer is an upland shorebird with two black bands around its neck. It has a brown back and a white belly. Killdeer are found in a variety of open areas, even concrete or asphalt parking lots at shopping malls, as well as fields and beaches, ponds, lakes, road-side ditches, mudflats, airports, pastures, and gravel roads and levees (Mumford 1984). The clutch of four eggs is laid in a ground scrape in open habitats (Leck 1984). Since the early 1900's, killdeer have successfully

colonized most of NJ, and they occur in most types of open habitat including agricultural fields, parking lots, and airports (Walsh et al. 1999).

Breeding Bird Survey trend data from 1966-2002 indicate that killdeer populations have increased at an annual rate of 0.3%, 0.2%, and 0.5% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 1.94, a total New Jersey summer killdeer population could be estimated at approximately 1,600 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable trend for wintering populations of killdeer throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Killdeer are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, killdeer are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on killdeer populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued one (1) depredation permit to a NJ entity (an airport) to take 10 killdeer to protect human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of killdeer in New Jersey would be expected to be no more than approximately 50 birds in any one year under the Proposed Action. In addition WS may remove up to 20 killdeer nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of killdeer in New Jersey, WS should have minimal effects on local, statewide, regional or continental killdeer populations.

Mourning Doves

Mourning doves are migratory bird with substantial populations throughout much of North America. Many states in the U. S. have regulated annual hunting seasons for this species and take is liberal. However, New Jersey does not have a hunting season for mourning doves. This species is the most abundant dove in North America, is the champion of multiple brooding in its range, and is expanding northward (Ehrlich et al. 1988). Mourning doves are one of NJ's most widespread breeding bird species, and is a permanent resident throughout the state (Leck 1984). After its prolonged breeding season (February-October, Leck 1984), most congregate in large flocks particularly around agricultural fields (Walsh et al. 1999). They are year round residents in NJ.

Breeding Bird Survey trend data from 1966-2002 indicate that mourning dove populations have increased at an annual rate of 0.5% and 0.5% throughout New Jersey and the eastern region, respectively and have decreased at an annual rate of 0.3% throughout the United States (Sauer et al. 2003). With a relative abundance of 36.45, a total New Jersey summer mourning dove population could be estimated at approximately 30,000 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a stable trend for wintering populations of mourning doves throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Mourning doves are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, doves are taken in accordance with applicable state and federal laws

and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on mourning dove populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued three (3) depredation permits to NJ entities, authorizing the take of 60 mourning doves to protect human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of mourning dove in New Jersey would be expected to be no more than approximately 50 birds in any one year under the Proposed Action. In addition WS may remove up to 20 dove nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of doves in New Jersey, WS should have minimal effects on local, statewide, regional or continental mourning dove populations.

American Black Ducks

In New Jersey, American black ducks are permanent residents, but are most numerous in winter and during migration (Leck 1984). This species is a common spring and fall migrant, and many thousands of black ducks remain in the state during the winter (see below) (Walsh et al. 1999). Black ducks breeding habitat is variable, from marsh edges to woodlands, where nests may be far from water and sometimes off the ground (Walsh et al. 1999).

Breeding Bird Survey trend data from 1966-2002 indicate that American black duck populations have decreased at an annual rate of -0.2%, -0.3%, and -0.9% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable population trend for wintering populations of black ducks throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003).

Mid-winter waterfowl survey data reveals that black duck populations in the Atlantic Flyway have been relatively stable over the past 10 years (USFWS 2002). In NJ, the NJDFW completes the New Jersey portion of the USFWS's Atlantic Flyway Mid-Winter Waterfowl Survey during January of each year. Results of the 2003 Mid-Winter Survey estimated 108,333 black ducks in NJ (Serie and Raftovich 2003). The Atlantic Flyway Breeding Waterfowl Survey, also conducted by the NJDFW, estimated there to be 19,597 black ducks (including 7,997 breeding pairs) in the state during early summer (Serie and Raftovich 2002). In NJ, the 60-day black duck season occurs during October through January (split seasons, with slightly different dates for the North, South, and Coastal Zones). During the 2001-02 hunting season in New Jersey, an estimated 21,600 black ducks were harvested (Serie and Raftovich 2002)

Black ducks are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, black ducks are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on black duck populations would have no significant adverse impact on the quality of the human environment. . During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued one (1) depredation permit to a NJ entity to take 30 American black ducks to protect human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of black ducks in New Jersey would be expected to be no more than approximately 50 ducks in any one year under the Proposed Action.

Based on the above information, USFWS oversight, and WS limited lethal take of black ducks in New Jersey, WS should have minimal effects on local, statewide, regional or continental American black duck populations.

Mallard Ducks

The mallard is primarily a freshwater duck, nesting from mid-March into July (Leck 1984). The mallard is New Jersey's most widespread breeding duck (Walsh 1999), occurring in most freshwater habitats, marshes, swamps, ponds, lakes, and city parks.

Breeding Bird Survey trend data from 1966-2002 indicate that mallard duck populations have increased at an annual rate of 1.5%, 3.5%, and 3.5% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). New Jersey Christmas Bird Count data from 1966-2002 shows an increasing population trend for wintering populations of mallard ducks throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be increasing (NJDFW 2003).

Waterfowl survey data reveals that mallard populations have fluctuated over the past 10 years and are currently at the long term (1955-2001) survey average (USFWS 2002). The Atlantic Flyway Breeding Waterfowl Survey, conducted by the NJDFW, estimated there to be 61,600 mallards (including 28,933 breeding pairs) in the state during early summer, 2002 (Serie and Raftovitch 2003). In NJ, the NJDFW completes the New Jersey portion of the USFWS's Atlantic Flyway Mid-Winter Waterfowl Survey during January of each year. Results of the 2003 Mid-Winter Survey estimated 34,950 mallards in NJ (Serie and Raftovich 2003). The 60-day mallard season in NJ occurs during October through January (split seasons, with slightly different dates for the North, South, and Coastal Zones). During the 2001-02 hunting season in New Jersey, an estimated 22,200 mallards (and 2,300 mallard x black duck hybrids) were harvested (Serie and Raftovich 2002).

Mallard ducks are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, mallard ducks are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on mallard populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued eight (8) depredation permits to NJ entities to take 150 mallards and 180 mallard nests to protect human health and safety, and other resources.

Based upon an anticipated increase in requests for services, WS's lethal management of mallard ducks in New Jersey would be expected to be no more than approximately 50 ducks in any one year under the Proposed Action. In addition WS may remove up to 20 mallard nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of mallard ducks in New Jersey, WS should have minimal effects on local, statewide, regional or continental mallard duck populations.

Ring-billed Gulls

Ring-billed gulls are present throughout the year in NJ, but are most abundant during October-April, where they are typically found near inland lakes and reservoirs (Walsh et al. 1999). They are migratory birds which prefer to nest on islands with sparse vegetation. The U.S. breeding population of ring-billed gulls is divided into two populations; the western population and the eastern population. The eastern breeding population of the United States includes New York, Vermont, Ohio, Illinois, Michigan, Wisconsin, and Minnesota (Blokpoel and Tessier 1986). There are no known breeding colonies of ring-billed gulls in NJ. Ring-billed gulls nest in high densities. Nesting colonies may be located on islands, parklands, slag yards, rooftops, breakwalls, and landfills (Blokpoel and Tessier 1986).

In 1984, the population of ring-billed gulls in the Great Lakes region was estimated at approximately 648,000 pairs (Blokpoel and Tessier 1986). Blokpoel and Tessier (1992) found that the nesting population of ring-billed gulls in the Canadian portion of the lower Great Lakes system increased from 56,000 pairs to 283,000 pairs between 1976-1990.

Breeding Bird Survey trend data from 1966-2002 indicate that ring-billed gull populations have increased at an annual rate of 3.4%, and 2.9% throughout the United States and the eastern region, respectively (Sauer et al. 2003). Sauer et al. (2003) provides no information for the population of ring-billed gulls in New Jersey. New Jersey Christmas Bird Count data from 1966-2002 shows an increasing trend for wintering populations of ring-billed gulls throughout the state (National Audubon Society 2002). CBC data shows an average of 32,046 birds being counted statewide each year from 1976-97 (Walsh et al. 1999). In 2003, the NJDFW considers the population trend for this species to be increasing (NJDFW 2003).

Ring-billed gulls are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, gulls are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on ring-billed gull populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued nine (9) depredation permit to NJ entities to take 278 ring-billed gulls to protect property and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of ring-billed gulls in New Jersey would be expected to be no more than approximately 250 birds in any one year under the Proposed Action. In addition WS may remove up to 500 ring-billed gull nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of gulls in New Jersey, WS should have minimal effects on local, statewide, regional or continental ring-billed gull populations.

Herring Gulls

Herring gulls are the most widely distributed gull species in the Northern Hemisphere. These gulls breed in colonies near oceans, lakes, or rivers (Bent 1921). Herring gulls nest in all of the Great Lakes and will nest in natural or man-made sites, such as rooftops and breakwalls (Blokpoel and Scharf 1991b). Scharf et al (1978) reported 29,406 herring gull nests after surveying all nesting areas of colonial waterbirds in the U.S. Great Lakes in 1977. Dolbeer et al. (1990) reported an average annual increase of 11.9% in the number of herring gull nests in Lake Erie's Sandusky Bay over a 13-year period. Herring gulls are common throughout the year in NJ, with

the highest numbers occurring during the winter. The first reported NJ nesting of this species occurred in Stone Harbor (1946) (Leck 1984), and now the majority of NJ nesting colonies are in the Atlantic coast salt marshes of Cape May, Atlantic, and Ocean Counties (Walsh et al. 1999).

Breeding Bird Survey trend data from 1966-2002 indicate that herring gull populations have increased at an annual rate of 4.3% throughout New Jersey and have decreased at annual rate of -1.6 and -3.5% throughout the United States, and the eastern region, respectively (Sauer et al. 2003). New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable trend for wintering populations of herring gulls throughout the state (National Audubon Society 2002). CBC data shows an average of 68,875 birds being counted statewide each year from 1976-97 (Walsh et al. 1999). The NJDFW conducts an Aerial Colonial Waterbird Survey approximately every 4-6 years. The number of nesting herring gulls in NJ in 2001 was estimated by the NJDFW to be 9,814 (in 94 nesting sites), compared with an estimated 6,828 in 1995 (D. Jenkins, pers. comm. NJDFW, 2003).

Herring gulls are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, gulls are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on herring gull populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued eleven (11) depredation permits to NJ entities to take 328 herring gulls and 100 nests to protect property, natural resources, and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of herring gulls in New Jersey would be expected to be no more than approximately 250 birds in any one year under the Proposed Action. In addition WS may remove up to 100 herring gull nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of gulls in New Jersey, WS should have minimal effects on local, statewide, regional or continental herring gull populations.

Great Black-backed Gulls

The great black-backed gull is a marine species, which breeds in the North Atlantic region. The first record of this species breeding in NJ was in 1966, and they currently breed along the Atlantic Coast of Cape May, Atlantic, and Ocean Counties. The number of breeding great black-backed gulls in NJ increased from 140 in 1979 to 781 in 1995 (Jenkins et al. 1995), in Walsh et al. 1999). They are common throughout the year in NJ, but concentrations are greatest during the winter. They are mainly coastal, but often appear inland associated with landfills and other waste handling facilities. During the winter these gulls can also be found along the Great Lakes and larger rivers, such as the St. Lawrence River (Angehrn et al. 1979, Bull 1974). The over-wintering population of great black-backed gull has been increasing along the Great Lakes, along with the expansion of their breeding range (Angehrn et al. 1979). According to Blokpoel and Scharf (1991b), there has probably never been more than a dozen nesting pairs of great black-backed gulls along the Great Lakes.

Breeding Bird Survey trend data from 1966-2002 indicate that black-backed gull populations have decreased at an annual rate of -4.8%, and -2.2% throughout the United States and the eastern region, respectively (Sauer et al. 2003). Sauer et al. (2003) provides no information for the

population of black-backed gulls in New Jersey. New Jersey Christmas Bird Count data from 1966-2002 shows an increasing trend for wintering populations of black-backed gulls throughout the state (National Audubon Society 2002). CBC totals for 1976-97 averaged 11,599 birds observed by survey participants statewide (Walsh et al. 1999). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003). The NJDFW conducts an Aerial Colonial Waterbird Survey approximately every 4-6 years. The number of nesting greater black-backed gulls in NJ in 2001 was estimated by the NJDFW to be 1,036 (in 65 nesting sites), compared with an estimated 781 in 1995 (Jenkins et al. 1995).

Great black-backed gulls are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, gulls are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on great black-backed gull populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued nine (9) depredation permits to NJ entities to take 246 great black-backed gulls and 100 nests to protect natural resources and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of black-backed gulls in New Jersey would be expected to be no more than approximately 150 birds in any one year under the Proposed Action. In addition WS may remove up to 100 black-backed gull nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of gulls in New Jersey, WS should have minimal effects on local, statewide, regional or continental black-backed gull populations.

Laughing Gulls

Laughing gulls nest in three types of habitats: salt marshes, sand (with much or little vegetation), and on rocky islands with grassy areas (Bull 1974).

In NJ, laughing gulls breed in the coastal salt marshes of Cape May, Atlantic, and southern Ocean Counties (Walsh et al. 1999). After being reduced to only two breeding colonies in the early 1900's (Stone 1908), the laughing gull has increased substantially in the state. By 1995, an estimated 39,085 laughing gulls were counted on coast NJ salt marsh colonies (Walsh et al. 1999).

Breeding Bird Survey trend data from 1966-2002 indicate that laughing gull populations have decreased at an annual rate of -3.3% throughout the New Jersey and have increased at an annual rate of 4.0% and 4.1% throughout the United States and the eastern region, respectively and (Sauer et al. 2003). New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable trend for wintering populations of laughing gulls throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (NJDFW 2003). The NJDFW conducts an Aerial Colonial Waterbird Survey approximately every 4-6 years. The number of nesting laughing gulls in NJ in 2001 was estimated by the NJDFW to be 80,253 (in 112 nesting sites), compared with an estimated 39,085 in 1995 (Jenkins et al. 1995).

Laughing gulls are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, gulls are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird

management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on laughing gull populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued ten (10) depredation permit to NJ entities to take 898 laughing gulls to protect agriculture and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of laughing gulls in New Jersey would be expected to be no more than approximately 550 birds in any one year under the Proposed Action. In addition WS may remove up to 200 laughing gull nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of gulls in New Jersey, WS should have minimal effects on local, statewide, regional or continental laughing gull populations.

Snow Geese

The snow goose is a common and numerous migrant and winter resident in southern and central New Jersey, especially along the state's southern Atlantic coast, as well as in the Delaware Bay Shore in Cumberland and Salem Counties. Some wintering flocks remain in NJ into mid-May (Leck 1984). Snow geese breed in Arctic Canada from Ellesmere Island south to northern Ontario, and on the east coast of the U.S., winters from New York to North Carolina (Walsh et al. 1999).

No Breeding Bird Survey trend data was available for snow goose populations (Sauer et. al 2003). New Jersey Christmas Bird Count data from 1966-2002 shows an increasing trend for wintering populations of snow geese throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be increasing (Birds of NJ Checklist, NJDFW website). According to USFWS (2002), birds from two distinct populations of snow geese spend at least a portion of the winter in NJ: the greater snow goose population and the mid-continent population. Waterfowl survey data from 1972-2002 show an increasing trend for both of these populations with the greater snow goose population and mid-continent population increasing an average of 4% and 2% a year since 1993, respectively (USFWS 2002). In NJ, the NJDFW completes the New Jersey portion of the USFWS's Atlantic Flyway Mid-Winter Waterfowl Survey during January of each year. Results of the 2003 Mid-Winter Survey estimated 110,310 snow geese in NJ (Serie and Raftovich 2003). In NJ, the107-day snow goose season occurs during October -February in the North and Coastal Zones, and during October and November-March in the South Zone. During the 2001-02 hunting season in New Jersey, an estimated 11,600 snow geese were harvested (Serie and Raftovich 2002)

Snow geese are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, snow geese are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds; and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on snow goose populations would have no significant adverse impact on the quality of the human environment. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002), the USFWS issued eight (8) depredation permit to NJ entities to take 1170 snow geese to protect agriculture and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of snow geese in New Jersey would be expected to be no more than approximately 300 geese in any one year under the Proposed Action.

Based on the above information, USFWS oversight, and WS limited lethal take of snow geese in New Jersey, WS should have minimal effects on local, statewide, regional or continental snow goose populations.

Mute Swans

The mute swan was introduced from Europe into the United States in the late 19th century near New York City. Feral breeding took place after 544 more individuals were introduced in the lower Hudson Valley in 1910 and on Long Island in 1912. In the eastern United States, scattered breeding now occurs from Massachusetts to Virginia (Master 1992). Feral populations became established over time as swans that had escaped or been intentionally released from captivity survived and reproduced in the wild. Mute swans prefer freshwater ponds and streams of 10 acres or less and coastal bays and salt marshes. Eastern birds migrate short distances to coastal bays for the winter. The swan's diet consists mostly of rooted aquatic vegetation. Small islands, narrow peninsulas, and clumps of aquatic vegetation are preferred nesting sites. Nesting territories vary in size from 4 to 10 acres and are used year-around or reoccupied each year. The mute swan lays the largest of all swan eggs, and a typical clutch of four to eight eggs takes 35 to 38 days to hatch.

Since 1986, the Atlantic Flyway population of feral mute swans has grown 118%, from 5,800 birds to over 12,600 swans. This growth is seen throughout the Flyway, especially in the Chesapeake Bay region (Maryland and Virginia) which has increased 1271.3% (Atlantic Flyway Council 2000). This rapid growth rate in the Chesapeake Bay shows the potential growth rate that this invasive species could have throughout the Flyway. The upper Mid-Atlantic States of New York, New Jersey, and Pennsylvania had a combined mute swan growth rate of 62.4%, with New Jersey showing a an increase of 157.8% (Atlantic Flyway Council 2000). The Atlantic Flyway Counsel's Mid-Summer Mute Swan Survey results indicate that the NJ mute swan population estimate has increased from 550 birds in 1986 to 1602 birds in 2002 (an increase of 291%, or 12.6% per year) (Atlantic Flyway Council 2002). The Atlantic Flyway Mid-Winter Waterfowl Survey reported there to be 2,248 mute swans in NJ during January, 2003. It is a permanent resident, and nests from March through June (Leck 1984).

Breeding Bird Survey trend data from 1966-2002 indicate that mute swan populations have increased at an annual rate of 15.0%, 11.1%, and 11.0% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). New Jersey Christmas Bird Count data from 1966-2002 shows an increasing trend for wintering populations of mute swans throughout the state (National Audubon Society 2002).

Mute swans are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, mute swans are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds; and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on mute swan populations would have no significant adverse impact on the quality of the human environment. The number of swans authorized to be taken under FWS-issued permits will be guided by Atlantic Flyway Mute Swan Management Plan and a Final Environmental Assessment completed by the FWS on mute swan management in the Atlantic Flyway. During Federal Fiscal Year (FY) 2002 (October 2001 through September 2002),

the USFWS issued two (2) depredation permits to NJ entities to take 30 mute swans and 10 nests to protect natural resources and human health and safety.

Based upon an anticipated increase in requests for services, WS's lethal management of mute swans in New Jersey would be expected to be no more than approximately 300 birds in any one year under the Proposed Action. In addition WS may remove up to 300 mute swan nests on an annual basis.

Based on the aboveinformation, USFWS oversight, and WS limited lethal take of mute swans in New Jersey, WS should have minimal effects on local, statewide, regional or continental mute swan populations.

American Crows

The American crow is a common and broadly distributed breeding bird in New Jersey (Walsh et al. 1999). It nests throughout the state from mid-March through mid-May, and forms large winter roosts (Leck 1984). Crows have clutches of 4-5 eggs, one or twice per year (Kalmbach 1939). The life expectancy for a crow in the wild is 4-6 years, however, crows have been known to live up to 14 years in the wild and 20 years in captivity (Johnson 1994).

In fall and winter, crows form large flocks. The flocks roost together at night and disperse to different feeding areas during the day. Crows will fly up to 6-12 miles from the roost to a feeding site each day (Johnson 1994). During the spring and summer, crows forage most intensively close to the nest with a maximum home range size of 1,000 meters^2 (0.621 miles^2) (Sullivan and Dinsmore 1990). After dispersing from the roost, crows begin foraging around sunrise each day (Knopf and Knopf 1983, Stouffer and Caccamise 1991). By late morning, the crows decrease foraging activity, and by mid-afternoon crows start forming larger groups (Knopf and Knopf 1983, Stouffer and Caccamise 1991). The larger groups, which forage in late afternoon, return to the roost at sunset.

American crows have a wide range and are extremely abundant, being found in most of the United States (National Audubon Society 2000) and in NJ. They are found in both urban and rural environments and oftentimes form large communal roosts in cities. In the U.S., some crow roosts may reach a half-million birds (National Audubon Society, 2000). In NJ, many crows are permanent residents, although some do migrate (Walsh et al. 199).

Historically, crow populations have benefited from agricultural development because of grains available as a food supply. In some areas where abundant food and roosting sites are available, large flocks of crows will tend to concentrate. Large fall and winter roosts of crows may cause serious problems in some areas, particularly when located in towns or on other sites located near people. Such roosts are objectionable because of the odor and health concerns of the bird droppings, noise, and damage to trees in the roost.

Breeding Bird Survey trend data from 1966-2002 indicate that American crow populations have increased at an annual rate of 1.4%, 1.4%, and 1.2% throughout New Jersey, the United States, and the eastern region, respectively (Sauer et al. 2003). With a relative abundance of 33.77, a total New Jersey summer crow population could be estimated at approximately 27,700 birds. New Jersey Christmas Bird Count data from 1966-2002 shows a relatively stable trend for wintering populations of crows throughout the state (National Audubon Society 2002). In 2003, the NJDFW considers the population trend for this species to be stable (Birds of NJ Checklist, NJDFW website). In NJ, American crows are hunted from August until mid-March (typically, 4 days per week, Monday, Thursday, Friday, and Saturday). The number of crows harvested during the hunting season is not available.

The USFWS has established a Federal Depredation Order (50 CFR 21.43) for crows; no Federal permit is required by anyone to remove crows if they are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on crow populations would have no significant adverse impact on the quality of the human environment.

Based upon an anticipated increase in requests for services, WS's lethal management of crows in New Jersey would be expected to be no more than approximately 250 birds in any one year under the Proposed Action. In addition WS may remove up to 20 crow nests on an annual basis.

Based on the above information, USFWS oversight, and WS limited lethal take of crows in New Jersey, WS should have minimal effects on local, statewide, regional or continental American crow populations.

Domestic Waterfowl (Ducks and Geese)

Domestic waterfowl refers to captive-reared, domestic, of some domestic genetic stock, or domesticated breeds of ducks and geese. Examples of domestic waterfowl include, but are not limited to, Muscovy ducks, Pekin ducks, Rouen ducks, Cayuga ducks, Swedish ducks, Chinese geese, Toulouse geese, Khaki Campbell ducks, Embden geese, and pilgrim geese.

Federal law does not protect domestic varieties of waterfowl (Title 50 CFR Part 21), nor are domestic waterfowl specifically protected by State law in NJ. Some domestic and feral waterfowl are capable of sustained flight, while others are incapable of flight at all, due to hybridization. Coloration of domestic waterfowl is highly variable. Domestic waterfowl in parks and other areas typically occur in flocks mixed with Canada geese and mallard ducks, but may also occur as large flocks of domestic birds. In NJ, there are no population estimates of domestic waterfowl, nor is there an accounting of those that occur in farm flocks. In NJ, domestic ducks and geese are common and abundant throughout the state, especially in urban/suburban environments where they may be fed by people, and maintain relatively high reproductive rates (pers. comm.. T. Nichols, NJ Division of Fish and Wildlife 2003). Domestic ducks and geese are non-indigenous species considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. They are not regulated or managed by Federal or State law. Any reduction in the number of domestic ducks and geese could be considered a beneficial impact to other native bird species.

Based upon past requests for WS assistance and an probable increase in future requests for services, WS anticipates that the number of domestic and feral ducks and geese managed by WS could increase above the current level. During Fiscal Years 2000-02, WS did not take any domestic ducks or geese, and provided technical assistance on 16 occasions. Assistance requests regarded protection of property and human health/safety. Under the Proposed Action WS's lethal take of domestic ducks and geese would be expected to be no more than 300 birds and 200 nests per year. Based on current abundance and distribution of domestic ducks and geese, and WS limited take of these birds in NJ, WS should have minimal effects on local, statewide, regional, or continental domestic duck and goose populations.

Other Target Species

Target species, in addition to the 19 bird species analyzed above, have been killed in small numbers by WS during the past year and have included include no more than 20 individuals of the following 22 species: eastern meadowlark, northern mockingbird, gray catbird, blue jay, tundra swan, belted kingfisher , double-crested cormorant, fish crow, ring-necked pheasant, snow

bunting, great blue heron, great egret, snowy egret, cattle egret, little blue heron, bank swallow, barn swallow, tree swallow, monk parakeet, downy woodpecker, hairy woodpecker, and red-bellied woodpecker .

These other target species could be killed or have nests removed during BDM. Most of these birds are protected by the USFWS under the Migratory Bird Treaty Act and the take is limited by permit. Therefore, these birds are taken in accordance with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs, including the USFWS and the NJDFW permitting processes. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on these bird populations would have no significant adverse impact on the quality of the human environment.

Based upon an anticipated increase in future requests for WS assistance, WS predicts that no more than 20 individuals and no more than 20 nests of each of the above mentioned 22 target bird species would be lethally removed annually under the proposed action. None of the above mentioned bird species are expected to be taken by WS BDM at any level that would adversely affect overall bird populations.

The following four species of birds would not be lethally taken, but would be trapped and relocated pursuant to permits and other authorizations: rough-legged hawk, red-tailed hawk, American kestrel, and northern harrier. No nests or eggs of these species would be taken by WS.

4.1.1.3 Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, WS would not take any target bird species because no lethal methods would be used. Although WS lethal take of birds would not occur, it is likely that without WS conducting some level of lethal BDM activities for these species, private BDM efforts would increase, leading to potentially similar or even greater effects on target species populations than those of the current program alternative. For the same reasons shown in the population effects analysis in section 4.1.1.2, however, it is unlikely that target bird populations would be adversely impacted by implementation of this alternative. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations. DRC-1339 is currently only available for use by WS employees and would not be available for use under this alternative. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably be about the same as those under Alternative 1, but less than Alternative 4.

4.1.1.4 Alternative 4: No Federal WS Bird Damage Management

Under this alternative, WS would have no impact on target bird populations in the State. Private efforts to reduce or prevent depredations could increase which could result in effects on target species populations to an unknown degree. Effects on target species under this alternative could be the same, less, or more than those of the proposed action depending on the level of effort expended by private persons. For the same reasons shown in the population effects analysis in section 4.1.1.2, it is unlikely that target bird populations would be adversely impacted by implementation of this alternative. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations. DRC- 1339 and the tranquilizer alpha-chloralose are currently only available for use by WS employees and would not be available for use under this alternative.

4.1.2 Effects on Other Wildlife Species, including T&E Species

4.1.2.1 Alternative 1: Technical Assistance Only

Alternative 1 would not allow any WS direct operational BDM in New Jersey. Non-target or T&E species would not be impacted by WS activities from this alternative. Technical assistance or self-help information would be provided at the request of producers and others. Although technical support might lead to more selective use of control methods by private parties than that which might occur under Alternative 4, private efforts to reduce or prevent depredations could still result in less experienced persons implementing control methods, leading to greater take of non-target wildlife than under the proposed action. It is hypothetically possible that, similar to Alternative 3 and 4, frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local non-target species populations, including some T&E species. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

4.1.2.2 Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

Adverse Effects on Non-target (non-T&E) Species. There has been no lethal take of non-target species by WS while conducting BDM activities in New Jersey. Although it is possible that some non-target birds may be unknowingly killed by use of DRC-1339, the method of application is designed to minimize or eliminate that risk. For example, DRC-1339 treated bait is only applied after a period of prebaiting with untreated bait material and when non-target birds are not observed coming to feed at the site. WS take of non-target species during BDM activities is expected to be extremely low to non-existent. While every precaution is taken to safeguard against taking non-target birds, changes in local flight patterns and other unanticipated events can result in the incidental take of unintended species. These occurrences are rare and should not affect the overall populations of any species under the current program.

Beneficial Effects on Non-target Species. Control operations as proposed in this alternative could reduce starling and cowbird populations on a local level. Reduction in nest site competition would be a beneficial impact on the native bird species that are adversely affected by interspecific nest competition by these birds.

T&E Species Effects. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. WS has consulted with the USFWS under Section 7 of the ESA concerning potential impacts of BDM methods on T&E species and has obtained a Biological Opinion. For the full context of the Biological Opinion, see Appendix F of the ADC Final EIS (USDA 1997, Appendix F). For the preparation of this EA in 2003, WS obtained and reviewed the list of federally listed T&E species for the state of New Jersey (Appendix C) and determined that the proposed WS BDM program would not likely adversely affect any T&E species or critical habitat. The USFWS concurs with this determination (Appendix D).

Additionally, as stated in the 1992 BO, the USFWS has determined that the only BDM method that might adversely affect the bald eagle was above ground use of strychnine treated bait for "nuisance birds." Strychnine is no longer registered for above ground use and would not be used by WS for BDM in the State. DRC-1339/Starlicide® poses no primary hazard to eagles because eagles do not eat grain or other bait materials on which this chemical might be applied during BDM, and further, because eagles are highly resistant to DRC-1339 - up to 100 mg doses were force fed to captive golden eagles with no mortality or adverse effects noted other than regurgitation and head-shaking (Larsen and Dietrich 1970). Secondary hazards to raptors from

DRC-1339/Starlicide® and Avitrol® are low to nonexistent (see Appendix B). Therefore, WS BDM in New Jersey is not likely to adversely affect bald eagles.

WS has obtained and reviewed the list of New Jersey State listed T&E species, species of concern, and species of special interest (Appendix E). WS has determined, and the NJDFW has concurred, that the proposed WS BDM program is not likely to adversely impact any state listed endangered or threatened species, as long as the management techniques are not directed specifically at any state listed species (Appendix F). The NJDFW ENSP also provided guidance regarding potential damage management activities conducted by WS directed at state listed species (Appendix F).

Mitigation measures to avoid T&E effects are described in Chapter 3 (Subsection 3.4.2) and are also described in Subsection 4.1.2 of this chapter. The inherent safety features of DRC-1339/Starlicide® and Avitrol® use that preclude or minimize hazards to mammals and plants are described in Appendix B and in a formal risk assessment in the ADC Final EIS (USDA 1997, Appendix P). Those measures and characteristics should assure there would be no jeopardy to T&E species or adverse effects on mammalian or non-T&E bird scavengers from the proposed action.

4.1.2.3 Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, WS take of non-target animals would hypothetically be less than that of the proposed action because no lethal control actions would be taken by WS. However, if bird damage problems were not effectively resolved by non-lethal control methods, members of the public may resort to other means of lethal control such as the use of shooting or even illegal use of chemical toxicants. This could result in less experienced persons implementing control methods and could lead to greater take of non-target wildlife than the proposed action. For example, shooting by persons not proficient at bird identification could lead to killing of non-target birds. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local non-target species populations, including T&E species. Hazards to raptors, including bald eagles and falcons, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

4.1.2.4 Alternative 4: No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. There would be no impact on non-target or T&E species by WS BDM activities from this alternative. However, private efforts to reduce or prevent depredations could increase which could result in less experienced persons implementing control methods and could lead to greater take of non-target wildlife than under the proposed action. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could impact local non-target species populations, including some T&E species. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

4.1.3 Effects on Human Health and Safety

4.1.3.1 Effects of Chemical BDM Methods on Human Health

Alternative 1: Technical Assistance Only

Alternative 1 would not allow any direct operational BDM assistance by WS in the State. Concerns about human health risks from WS's use of chemical BDM methods would be alleviated because no such use would occur. DRC-1339 and alpha-chloralose are only registered for use by

WS personnel and would not be available for use by private individuals. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and leading to a greater risk than the Proposed Action alternative. However, because some of these private parties would be receiving advice and instruction from WS, concerns about human health risks from chemical BDM methods use should be less than under Alternative 4. Commercial pest control services would be able to use Avitrol® and Starlicide® and such use would likely occur to a greater extent in the absence of WS's assistance. Use of Avitrol® and Starlicide® in accordance with label requirements should preclude any hazard to members of the public. Hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC- 1339 and Avitrol®, could pose secondary poisoning hazards to pets. Some chemicals that could be used illegally could present greater risks of adverse effects on humans than those used under the Proposed Action alternative.

Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

DRC-1339 DRC-1339 is the primary lethal chemical BDM method that would be used under the proposed program alternative. Some concern has been generated by a few members of the public that unknown, but significant, risks to human health may exist from DRC-1339 used for BDM.

This chemical is one of the most extensively researched and evaluated pesticides ever developed. Over 30 years of studies have demonstrated the safety and efficacy of this compound. Appendix B provides more detailed information on DRC-1339 and its use in BDM. Factors that virtually eliminate any risk of public health problems from its use are:

- Its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops.
- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours, which means that treated bait material generally is nearly 100% broken down within a week.
- It is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people.
- Application rates are extremely low (less than 0.1 lb. of active ingredient per acre) (EPA 1995).
- A human would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.
- The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) studies, this chemical is not a mutagen or a carcinogen (i.e., cancer-causing agent) (EPA 1995). Notwithstanding, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The above analysis indicates that human health risks from DRC-1339 use would be virtually nonexistent under any alternative.

Avitrol® (4-Aminopyridine). Avitrol® is another chemical method that might be used by WS in BDM. Appendix B provides more detailed information on this chemical.

Avitrol® is available as a prepared grain bait mixture or as a powder. It is formulated in such a way that ratios of treated baits to untreated baits are no greater than 1:9. Factors that virtually eliminate health risks to members of the public from use of this product as an avicide are:

- It is readily broken down or metabolized into removable compounds that are excreted in urine in the target species (ETOXNET 1996). Therefore, little of the chemical remains in killed birds to present a hazard to humans.

- A human would need to ingest the internal organs of birds found dead from Avitrol® ingestion to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur. Furthermore, secondary hazard studies with mammals and birds have shown that there is virtually no hazard of secondary poisoning.

- Although Avitrol® has not been specifically tested as a cancer-causing agent, the chemical was found not to be mutagenic in bacterial organisms (EPA 1997). Therefore, the best scientific information available indicates it is not a carcinogen. Notwithstanding, the extremely controlled and limited circumstances in which Avitrol® is used would prevent exposure of members of the public to this chemical.

The above analysis indicates that human health risks from Avitrol® use would be virtually nonexistent under any alternative.

Other BDM Chemicals. Other non-lethal BDM chemicals that might be used or recommended by WS would include repellents such as methyl or di-methyl anthranilate (artificial grape flavoring used in foods and soft drinks sold for human consumption), which has been used as an area repellent; anthraquinone which is presently marketed as Flight Control®; and the tranquilizer drug alpha-chloralose. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by the EPA or Food and Drug Administration (FDA). Any operational use of chemical repellents would be in accordance with labeling requirements under FIFRA and state pesticide laws and regulations which are established to avoid unreasonable adverse effects on the environment. Following labeling requirements and use restrictions are a built-in mitigation measure that would assure that use of registered chemical products would avoid significant adverse effects on human health.

Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1997).

Alternative 3: Non-lethal Bird Damage Management Only by WS

Alternative 3 would not allow for any lethal methods use by WS in the State. WS could only implement non-lethal methods such as harassment and exclusion devices and materials. Non-lethal methods could, however, include Avitrol®, the tranquilizer drug alpha-chloralose and chemical repellents such as anthraquinone and methyl anthranilate. Impacts from WS use of these chemicals would be similar to those described under the proposed action.

Excessive cost or ineffectiveness of non-lethal techniques could result in some entities rejecting WS's assistance and resorting to other means of BDM. Such means could include illegal pesticide

uses. Hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC-1339 and Avitrol®, could pose secondary poisoning hazards to pets. Some chemicals that could be used illegally could present greater risks of adverse effects on humans than those used under the proposed alternative.

Alternative 4: No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. Concerns about human health risks from WS's use of chemical BDM methods would be alleviated because no such use would occur. DRC- 1339 and alpha-chloralose are only registered for use by WS personnel and would not be available for use by private individuals. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the proposed action alternative. Commercial pest control services would be able to use Avitrol® and Starlicide® and such use would likely occur to a greater extent in the absence of WS assistance. Use of Avitrol® and Starlicide® in accordance with label requirements should preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC- 1339 and Avitrol®, could pose secondary poisoning hazards to pets. Some chemicals that could be used illegally could present greater risks of adverse effects on humans than those used under the current program alternative.

4.1.3.2 Effects of Non-chemical BDM Methods on Human Safety

Alternative 1: Technical Assistance Only

Under this alternative, WS would not engage in direct operational use of any non-chemical BDM methods. Risks to human safety from WS's use of firearms and pyrotechnics would hypothetically be lower than the Proposed Action alternative, since WS would not be conducting direct control activities. Hazards to humans and property could be greater under this alternative if personnel conducting BDM activities using non-chemical methods are poorly or improperly trained.

Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

Non-chemical BDM methods that might raise safety concerns include shooting with firearms and harassment with pyrotechnics. Firearms are only used by WS personnel who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The New Jersey WS program has had no accidents involving the use of firearms or pyrotechnics in which any person was harmed. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1997, Appendix P). Therefore, no adverse affects on human safety from WS's use of these methods is expected.

Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, non-chemical BDM methods that might raise safety concerns include shooting with firearms when used as a harassment technique and harassment with pyrotechnics. Firearms are only used by WS personnel who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The

New Jersey WS program has had no accidents involving the use of firearms or pyrotechnics in which a member of the public or any other person was harmed. A formal risk assessment of WS operational management methods found that risks to human safety were low (USDA 1997, Appendix P). Therefore, no adverse affects on human safety from WS's use of these methods is expected.

Alternative 4: No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. Concerns about human health risks from WS's use of non-chemical BDM methods would be alleviated because no such use would occur. The use of firearms or pyrotechnics by WS would not occur in BDM activities in New Jersey. However, private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the proposed action alternative. Commercial pest control services would be able to use pyrotechnics or firearms in BDM programs and this activity would likely occur to a greater extent in the absence of WS assistance. Hazards to humans and property could be greater under this alternative if personnel conducting BDM activities using non-chemical methods are poorly or improperly trained.

4.1.3.3 Effects on Human Health and Safety from Birds

Alternative 1: Technical Assistance Only

With WS technical assistance but no direct management, entities requesting BDM assistance for human health concerns would either take no action, which means the risk of human health problems would likely continue or increase in each situation as bird numbers are maintained or increased, or implement WS recommendations for non-lethal and lethal control methods. Potential impacts would be variable. Individuals or entities that implement management actions may or may not have the experience necessary to efficiently and effectively conduct an effective BDM program. In some situations the implementation of non-lethal controls such as electric or porcupine wires, netting barriers, and harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other urban roosting sites not previously affected. This potential risk would be less likely under this alternative than Alternative 4 when people requesting assistance receive and accept WS technical assistance recommendations.

Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

People are concerned with potential injury, illness, and loss of human life as a result of the potential impacts of injurious bird species. An Integrated BDM strategy, a combination of lethal and non-lethal means, has the greatest potential of successfully reducing this risk. All BDM methods could possibly be implemented and recommended by WS.

An IWDM approach reduces damage or threats to public health or safety for people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. As discussed in Chapter 1, birds are a threat to aviation safety and can also carry or transmit diseases to humans. In most cases, it is difficult to conclusively prove that birds were responsible for transmission of individual human cases or outbreaks of bird-borne diseases. Nonetheless, certain requesters of BDM service may consider this risk to be unacceptable and may request such service primarily for that reason. In such cases, BDM, either by lethal or non-lethal means, would, if successful, reduce the risk of bird-borne disease transmission at the site for which BDM is requested.

In some situations the implementation of non-lethal controls such as electric or porcupine wires, netting barriers, and harassment could actually increase the risk of human health problems at other

sites by causing the birds to move to other urban roosting sites not previously affected. In such cases, lethal removal of the birds may actually be the best alternative from the standpoint of overall human health concerns in the local area. If WS is providing direct operational assistance in relocating birds, coordination with local authorities may be conducted to assure they do not reestablish in other undesirable locations.

Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, WS would be restricted to implementing and recommending only non-lethal methods in providing assistance with bird damage problems. The success or failure of the use of non-lethal methods can be quite variable. In some situations the implementation of non-lethal controls such as electric or porcupine wires, netting barriers, and harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other urban roosting sites not previously affected. Some requesting entities, such as city government officials, would reject WS assistance for this reason and would likely seek to achieve bird control by other means. However, if WS is providing direct operational assistance in relocating birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

Alternative 4: No Federal WS Bird Damage Management

With no WS assistance, cooperators would be responsible for developing and implementing their own BDM program. Cooperator efforts to reduce or prevent conflicts could result in less experienced persons implementing control methods, therefore leading to a greater potential of not reducing bird hazards, than under the proposed action. In some situations the implementation of non-lethal controls such as electric or porcupine wires, netting barriers, and harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other urban roosting sites not previously affected. Under this alternative, human health problems could increase if private individuals were unable to find and implement effective means of controlling birds that cause damage problems.

4.1.4 Impacts to Stakeholders, including Aesthetics

4.1.4.1 Effects on Human Affectionate Bonds with Individual Birds and on Aesthetic Values of Wild Bird Species

Alternative 1: Technical Assistance Only

Under this alternative, WS would not conduct any direct operational BDM, but would still provide technical assistance or self-help advice to persons requesting assistance with bird damage. Additionally, WS would not conduct any harassment of birds that were causing damage. Those who oppose direct operational assistance in wildlife damage management by the government, but favor government technical assistance, would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative because the individual birds would not be killed by WS. However, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the Proposed Action alternative.

Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

Those who routinely view or feed individual birds would likely be disturbed by removal of such birds under the current program. WS is aware of such concerns and takes these concerns into consideration to mitigate effects. WS may be able to mitigate such concerns by leaving certain birds that have been identified by interested individuals.

Some members of the public have expressed opposition to the killing of any birds during BDM activities. Under this Proposed Action alternative, some lethal control of birds would occur and these persons would be opposed. However, many persons who voice opposition have no direct connection or opportunity to view or enjoy the particular birds that would be killed by WS's lethal control activities. Lethal control actions would generally be restricted to local sites and to small, unsubstantial percentages of overall populations. Therefore, the species subjected to limited lethal control actions would remain common and abundant and would, therefore, continue to remain available for viewing by persons with that interest.

Lethal removal of birds from airports should not affect the public's enjoyment of the aesthetics of the environment since airport properties are closed to public access. The ability to view and interact with birds at these sites is usually either restricted to viewing from a location outside boundary fences or is forbidden.

Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, WS would not conduct any lethal BDM, but may conduct harassment of birds that are causing damage. Some people who oppose lethal control of wildlife by the government, but are tolerant of government involvement in non-lethal wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by the death of individual birds under this alternative, but might oppose dispersal or translocation of certain birds. WS may be able to mitigate such concerns by leaving certain birds that have been identified by interested individuals. In addition, the abundant populations of target bird species in urban environments would enable people to continue to view them and to establish affectionate bonds with individual wild birds. Although WS would not perform any lethal activities under this alternative, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the proposed action alternative.

Alternative 4: No Federal WS Bird Damage Management

Under this alternative, WS would not conduct any lethal removal of birds nor would the program conduct any harassment of birds. Those in opposition of any government involvement in wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative. However, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the proposed action alternative.

4.1.4.2 Effects On Aesthetic Values of Property Damaged by Birds

Alternative 1: Technical Assistance Only

Under this alternative, the lack of operational assistance in reducing bird problems could result in an increase of potential adverse affects on aesthetic values. However, potential adverse affects would likely be less than as those under Alternative 4, since WS would be providing technical assistance.

Relocation of nuisance roosting or nesting populations of birds (e.g., starling roosts) through harassment, barriers, or habitat alteration can sometimes result in the birds causing the same problems at the new location. If WS has only provided technical assistance to local residents or municipal authorities, coordination with local authorities to monitor the birds' movements to

assure the birds do not reestablish in other undesirable locations might not be conducted, thereby increasing the potential of adverse effects to nearby property owners.

Alternative 2: Integrated Bird Damage Management Program (Proposed Action/No Action)

Under this alternative, operational assistance in reducing bird problems, in which droppings from the birds cause an unsightly mess, would improve aesthetic values of affected properties. In addition, individuals objecting to the presence of invasive nonnative species, such as European starlings, domestic feral pigeons, and English sparrows, and whose aesthetic enjoyment of other birds is diminished by the presence of such species, will be positively affected by programs which result in reductions in the presence of such birds.

Relocation or dispersal of nuisance roosting or nesting populations of birds (e.g., starling roosts) by harassment can sometimes result in the birds causing the same or similar problems at the new location. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, WS would be restricted to non-lethal methods only. Assuming property owners would choose to allow and pay for the implementation of these non-lethal methods, this alternative could result in birds relocating to other sites where they would likely cause or aggravate similar problems for other property owners. Thus, this alternative would likely result in more property owners experiencing adverse effects on the aesthetic values of their properties than the Proposed Action alternative.

Relocation or dispersal of nuisance roosting or nesting populations of birds (e.g., starling roosts) by harassment can sometimes result in the birds causing the same or similar problems at the new location. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

Alternative 4: No Federal WS Bird Damage Management

Under this alternative, the lack of any operational or technical assistance in reducing bird problems would mean aesthetic values of some properties would continue to be adversely affected if the property owners were not able to achieve BDM some other way. In many cases, this type of aesthetic damage would worsen because property owners would not be able to resolve their problems.

Relocation of nuisance roosting or nesting population of birds (e.g., starling roosts) through harassment, barriers, or habitat alteration can sometimes result in the birds causing the same problems at the new location. Coordination of dispersal activities by local residents with local authorities to monitor the birds' movements to assure the birds do not re-establish in other undesirable locations might not be conducted, thereby increasing the potential of adverse effects to nearby property owners.

4.1.5 Humaneness and Animal Welfare Concerns of Methods Used

4.1.5.1 Alternative 1: Technical Assistance Only

Under this alternative, WS would provide self-help advice only. Thus, lethal methods, viewed as inhumane by some persons, would not be used by WS. Without WS direct operational assistance,

it is expected that many requesters of BDM would reject non-lethal recommendations or would not be willing to pay the extra cost of implementing and maintaining them and would seek alternative lethal means. Similar to Alternative 3, DRC-1339 would no longer be available as it is only registered for use by or under the direct supervision of WS personnel. Thus, the only chemical BDM methods legally available would be Avitrol® and Starlicide®. The use of Avitrol® may be viewed by many persons as less humane than DRC-1339 or Starlicide®. Improper or illegal use of both chemicals would likely be viewed as inhumane by the public. Similar to the proposed action, shooting and live trapping/capture and euthanization by decapitation, cervical dislocation, or CO_2 gas could be used by these entities. Overall, BDM under this alternative would likely be somewhat less humane than the Proposed Action alternative, but slightly more humane than Alternative 4.

4.1.5.2 Alternative 2: Implement an Integrated Bird Damage Management Program (Proposed Action/No Action)

Under this alternative, methods viewed by some persons as inhumane would be used in BDM by WS. These methods would include shooting and toxicants/chemicals such as DRC-1339 and Avitrol®.

Shooting, when performed by experienced professionals, usually results in a quick death for target birds. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then dispatched or euthanized. Some persons would view shooting as inhumane.

The primary lethal chemical BDM method that would be used by WS under this alternative would be DRC-1339. This chemical causes a quiet and apparently painless death resulting from uremic poisoning and congestion of major organs (Decino et al. 1966). The birds become listless and lethargic, and a quiet death normally occurs in 24 to 72 hours following ingestion. However, the method appears to result in a less stressful death than that which probably occurs by most natural causes, such as by disease, starvation, or predation. For these reasons, WS considers DRC-1339 use to be a relatively humane method of lethal BDM. However, despite the apparent painlessness of the effects of this chemical, some persons will view any method that takes a number of hours to cause death as inhumane and unacceptable.

The chemical Avitrol® repels birds by poisoning a few members of a flock, causing them to become hyperactive. Their distress calls generally alarm the other birds and cause them to leave the site. Only a small number of birds need to be affected to cause alarm in the rest of the flock. The affected birds generally die. In most cases where Avitrol® is used, only a small percentage of the birds are affected and killed by the chemical with the rest being merely dispersed. In experiments to determine suffering, stress, or pain in affected animals, Rowsell et. al. (1979) tested Avitrol® on pigeons and observed subjects for clinical, pathological, or neural changes indicative of pain or distress. None were observed. Conclusions of the study were that the chemical met the criteria for a humane pesticide. Notwithstanding, some persons would view Avitrol® as inhumane treatment of the birds that are affected by it based on the birds' distress-like behavior.

Occasionally, birds captured alive by use of the tranquilizer Alpha-chloralose, cage traps, by hand, or with nets would be euthanized. The most common method of euthanization would be by CO_2 gas, cervical dislocation, or other methods which are described and approved by AVMA as humane euthanasia methods (Beaver et al. 2001). Most people would view AVMA-approved euthanization methods as humane.

4.1.5.3 Alternative 3: Non-lethal Bird Damage Management Only by WS

Under this alternative, lethal methods, viewed as inhumane by some persons, would not be used by WS. However, it is expected that many requesters of BDM assistance would reject non-lethal methods recommended by WS and/or would not be willing to pay the extra cost of implementing and maintaining them and would seek alternative lethal means. DRC-1339 would not be available to non-WS entities; however, Avitrol® and Starlicide® would be legal for use by certified pest control operators. Avitrol® could be used or recommended by WS under this alternative. Avitrol® would most likely be viewed as less humane than DRC-1339 or Starlicide® because of the distress behaviors that it causes. Shooting could be used by non-WS entities and, similar to the current program alternative, would be viewed by some persons as inhumane. Live trapping/capture and euthanization by decapitation, cervical dislocation, or CO_2 gas could also be used by these entities.

4.1.5.4 Alternative 4: No Federal WS Bird Damage Management

Under this alternative, methods viewed as inhumane by some persons would not be used by WS. Similar to Alternatives 1 and 3, DRC-1339 would no longer be available for use since it is only registered for use by or under the direct supervision of WS personnel. However, Avitrol® and Starlicide® would be legal for use by certified pest control operators. Avitrol® would most likely be viewed as less humane than DRC-1339 or Starlicide® because of the distress behaviors that it causes. Shooting could be used by non-WS entities and, similar to the proposed action alternative, would be viewed by some persons as inhumane. Live trapping/capture and euthanasia by decapitation, cervical dislocation, or CO_2 gas could also be used by these entities.

4.2 CUMULATIVE IMPACTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1, 2 and 3, WS would address damage associated with birds in a number of situations throughout the State. The WS BDM program would be the primary federal program with BDM responsibilities; however, some state and local government agencies may conduct BDM activities in New Jersey as well. Through ongoing coordination with these agencies, WS is aware of such BDM activities and may provide technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with such agencies in the same area, but may conduct BDM activities at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct BDM activities in the same area. The potential cumulative impacts analyzed below could occur either as a result of WS BDM program activities over time, or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

Cumulative Impacts on Wildlife Populations

Bird Damage Management methods used or recommended by the WS program in New Jersey will likely have no cumulative adverse effects on target and non-target wildlife populations. WS limited lethal take of target bird species is anticipated to have minimal impacts on target bird populations in New Jersey, the region, and the U.S. When control actions are implemented by WS the potential lethal take of non-target wildlife species is expected to be minimal to non-existent.

Cumulative Impact Potential from Chemical Components

BDM programs which include the use of pesticides as a lethal population management component may have the greatest potential for cumulative impacts on the environment as such impacts relate to deposit of

chemical residues in the physical environment and environmental toxicosis. The avicides, DRC-1339 and Starlicide®, and the frightening agent, Avitrol, are the only chemicals used or recommended by the New Jersey WS BDM program for the purpose of obtaining lethal effects on birds. These chemicals have been evaluated for possible residual effects which might occur from buildup of the chemicals in soil, water, or other environmental sites.

> ***DRC-1339*** exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantity of DRC-1339 that will be used in BDM programs in New Jersey, the chemical's instability which results in speedy degradation of the product, and application protocol used in WS programs further reduces the likelihood of any environmental accumulation. DRC-1339 is not used by any other entities in New Jersey.
>
> ***Starlicide®*** is similar to DRC-1339 used in feedlots; however, it contains 0.1% DRC-1339 (USDA 1997, Appendix P). Therefore, the cumulative impact potential from Starlicide® use should be similar to DRC-1339.
>
> ***Avitrol®*** may be used or recommended by the New Jersey WS program. Most applications would not be in contact with soil, applications would not be in contact with surface or ground water, and uneaten baits will be recovered and disposed of according to EPA label specifications. Avitrol® exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997 and EXTOXNET 2000). Because of Avitrol's characteristic of binding to soils, it is not expected to be present in surface or ground water as a result of its use on land (EPA 1980). A combination of chemical characteristics and baiting procedures used by WS would reduce the likelihood of environmental accumulation of Avitrol. The EPA has not required studies on the fate of Avitrol® in the soil because, based on use patterns of the avicide, soil residues are expected to be low (EPA 1980).

Based on use patterns, the chemical and physical characteristics of DRC-1339, Starlicide®, and Avitrol, and factors related to the environmental fate of these pesticides, no cumulative impacts are expected from the lethal chemical components used or recommended by the WS BDM program in New Jersey.

Non-lethal chemicals may also be used or recommended by the WS BDM program in New Jersey. Characteristics of these chemicals and use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in WS BDM programs in New Jersey.

Cumulative Impact Potential from Non-chemical Components

Non-chemical methods used or recommended by WS BDM program may include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and translocation or euthanasia of birds, harassment of birds or bird flocks, and shooting.

Because shooting may be considered as a component of the non-chemical, the deposition of lead shot in the environment is a factor considered in this EA.

> ***Lead Shot.*** Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species fed were observed more than one hundred years ago (Sanderson and Belrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. "Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. 'Certain other species' refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons." Alll WS BDM shooting activities conform to federal, state and local laws. If activities

are conducted near or over water, WS uses nontoxic shot during activities. Consequently, no deposition of lead in nontoxic shot zones is likely to occur as a result of WS BDM actions in New Jersey. Therefore, cumulative impacts are not likely to occur if toxic shot is used. Additionally, WS will evaluate other BDM actions which entail the use of shot on a case by case basis to determine if deposition of lead shot poses any risk to non-target animals, such as domestic livestock. If such risk exists, WS will use nontoxic shot in those situations.

Roost Harassment/Relocation. Some potential exists for cumulative impacts to human health and safety related to the harassment of roosting bird flocks such as European starlings in urban and suburban environments. If birds are dispersed from one site and relocated to another where human exposure to concentrations of bird droppings over time occurs, human health and safety could be threatened. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

SUMMARY

No significant cumulative environmental impacts are expected from any of the 4 alternatives. Under the Proposed Action, the lethal removal of birds by WS would not have a significant impact on overall target bird populations in New Jersey, but some local reductions may occur. No risk to public safety is expected when WS's services are provided and accepted by requesting individuals in Alternatives 1, 2, and 3, since only trained and experienced wildlife biologists/specialists would conduct and recommend BDM activities. There is a slight increased risk to public safety when persons who reject WS assistance and recommendations in Alternatives 1, 2 and 3 and conduct their own BDM activities, and when no WS assistance is provided in Alternative 4. In all 4 Alternatives, however, it would not be to the point that the impacts would be significant. Although some persons will likely be opposed to WS's participation in BDM activities on public and private lands within the state of New Jersey, the analysis in this EA indicates that WS Integrated BDM program will not result in significant cumulative adverse impacts on the quality of the human environment. Table 4-3 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4-3. Summary of Potential Impacts.

Issue	Alternative 1 Technical Assistance Only	Alternative 2 Integrated Bird Damage Management Program (Proposed Action/No Action)	Alternative 3 Nonlethal BDM Only by WS	Alternative 4 No Federal WS BDM Program
1. Target Species Effects	No effect by WS. Low effect - reductions in local target bird numbers by non-WS personnel likely; would not significantly affect state and regional populations.	Low effect - reductions in local target bird numbers; would not significantly affect state and regional populations	No effect by WS. Low effect - reductions in local target bird numbers by non-WS personnel likely; would not significantly affect state and regional populations.	No effect by WS. Low effect - reductions in local target bird numbers by non-WS personnel likely; would not significantly affect state and regional populations
2. Effects on Other Wildlife Species, Including T&E Species	No effect by WS. Impacts by non-WS personnel would be variable.	Low effect - methods used by WS would be highly selective with very little risk to non-target species.	Low effect - methods used by WS would be highly selective with very little risk to non-target species.	No effect by WS. Impacts by non-WS personnel would be variable.
3. Human Health and Safety Risks	Efforts by non-WS personnel to reduce or prevent conflicts could result in less experienced persons implementing control methods, leading to a greater potential of not reducing bird damage than under the proposed action.	The proposed action has the greatest potential of successfully reducing this risk.	Impacts could be greater under this alternative than the proposed action.	Efforts by non-WS personnel to reduce or prevent conflicts could result in less experienced persons implementing control methods, leading to a greater potential of not reducing bird damage than under the proposed action.
4a. Aesthetic Values of Wild Bird Species	Low to moderate effect. Local bird numbers in damage situations would remain high or possibly increase unless non-WS personnel successfully implement lethal methods; no adverse affect on overall regional and state target bird populations.	Low to moderate effect at local levels; Some local populations may be reduced; WS bird damage management activities do not adversely affect overall regional or state target bird populations.	Low to moderate effect. Local bird numbers in damage situations would remain high or possibly increase when non-lethal methods are ineffective unless non-WS personnel successfully implement lethal methods; no adverse affect on overall regional and state target bird populations.	Low to moderate effect. Local bird numbers in damage situations would remain high or possibly increase unless non-WS personnel successfully implement lethal methods; no adverse affect on overall regional and state target bird populations.
4b. Aesthetic Values of Property Damaged by Birds	Moderate to High effect - birds may move to other sites which can create aesthetic damage problems at new sites.	Low effect - bird damage problems most likely to be resolved without creating or moving problems elsewhere.	Moderate to High effect - birds may move to other sites which can create aesthetic damage problems at new sites. Less likely than Alt. 1 and 4.	High effect - bird problems less likely to be resolved without WS involvement. Birds may move to other sites which can create aesthetic damage problems at new sites
5. Humaneness and Animal Welfare Concerns of Methods Used	No effect by WS. Impacts by non-WS personnel would be variable.	Low to moderate effect - methods viewed by some people as inhumane would be used by WS.	Lower effect than Alt. 2 since only non-lethal methods would be used by WS	No effect by WS. Impacts by non-WS personnel would be variable.

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APPENDIX A
LITERATURE CITED

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APPENDIX B

BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE OR RECOMMENDATION BY THE NEW JERSEY WILDLIFE SERVICES PROGRAM

NON-LETHAL, NON-CHEMICAL METHODS

Agricultural producer and property owner practices. These consist primarily of non-lethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer or property owners/managers. Resource owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. These methods include:

> **Cultural methods.** Cultural methods may include altering planting dates so that crops are not young and vulnerable to damage when the damage-causing species are present, or the planting of crops that are less attractive or less vulnerable to such species. At feedlots or dairies, cultural methods generally involve modifications to the level of attention given to livestock, which may vary depending on the age and size of the livestock. Animal husbandry practices include, but are not limited to, techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).
>
> **Environmental/Habitat modification** can be an integral part of BDM. Wildlife production and/or presence is directly related to the type, quality, and quantity of suitable habitat. Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds. In most cases, the resource or property owner is responsible for implementing habitat modifications, and WS only provides advice on the type of modifications that have the best chance of achieving the desired effect. Habitat management is most often a primary component of BDM strategies at or near airports to reduce bird-aircraft strike hazards by eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from areas adjacent to aircraft runways. Habitat management is often necessary to minimize damage caused by starlings that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand.

Animal behavior modification. This refers to tactics that alter the behavior of wildlife to reduce damage. Animal behavior modification may involve use of scare tactics or fencing to deter or repel animals that cause loss or damage (Twedt and Glahn 1982). Some of the methods included in this category are:

- Bird-proof barriers
- Electronic guards
- Propane exploders
- Pyrotechnics
- Distress Calls and sound producing devices
- Chemical frightening agents
- Repellents
- Scare crows/Effigies
- Mylar tape
- Lasers
- Eye-spot balloons

These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium-filled eye-spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective, but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Graves and Andelt 1987, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988).

Bird proof barriers can be effective, but are often cost-prohibitive as the aerial mobility of birds usually requires overhead barriers as well as peripheral fencing or netting. Exclusionary devices, adequate to stop bird movements, can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Netting can be used to exclude birds from a specific area by the placement of bird-proof netting over and around the specific resource to be protected. Exclusion may be impractical in most settings (e.g., commercial agriculture); however, it can be practical in small areas (e.g., personal gardens) or for high-value crops (e.g., grapes) (Johnson 1994). Although this alternative would provide short-term relief from damage, it may not completely deter birds from feeding, loafing, staging, or roosting at that site. The public often finds exclusionary devices, such as netting, unsightly and fear the devices will lower the aesthetic value of the neighborhood when used over personal gardens.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scarecrows, and audio distress/predator vocalizations are effective in many situations for dispersing damage-causing bird species. These devices are sometimes effective, but usually only for a short period of time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota and Masake 1983, and Arhart 1972). Williams (1983) reported an approximate 50% reduction in blackbirds at two south Texas feedlots as a result of pyrotechnics and propane cannon use. However, these devices are often not practical in dairy or feedlot situations because of the disturbance to livestock, although livestock can generally be expected to habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Visual scaring techniques such as the use of mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly give birds a visual cue that a large predator is present), flags, lasers, and effigies, are occasionally effective in reducing bird damage. Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et.al. 1986, and Tobin et.al. 1988). Birds quickly learn to ignore visual and other scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics. For example, the use of effigies (either a carcass or a taxidermic preparation) as a component of an integrated vulture damage management program, contributes to the success of vulture roost dispersal activities (Humphrey et al. 2001, Tillman et al. 2002, and Avery et al. 2002). Effigies are hung upside down as high as possible in roost trees or from specially constructed masts to disperse vultures. A migratory bird permit is required from the USFWS before a vulture may be taken to use as an effigy or to salvage a dead vulture (e.g., road killed bird) to use as an effigy.

Lasers are a non-lethal technique recently evaluated by the USDA, APHIS, WS, National Wildlife Research Center (NWRC) (Blackwell et al. 2002, Glahn et al. 2000). For best results and to disperse numerous birds from a roost, the laser is most effectively used in periods of low light, such as after sunset and before sunrise. In the daytime, the laser can also be used during overcast conditions or in shaded areas to move individual and small numbers of birds, although the effective range of the laser is much diminished. Blackwell et al. (2002) tested lasers on several bird species and observed varied results among species. Lasers were ineffective at dispersing pigeons and mallards with birds habituating in approximately 5 minutes and 20 minutes, respectively (Blackwell et al. 2002). WS field applications of lasers have determined that blackbirds, starlings, and pigeons generally do not respond to low-powered lasers, while crows, gulls, herons, and some waterfowl species do respond. As with other BDM tools, lasers are most effective when used as part of an integrated management program.

Live traps. These consist of traps used to capture animals alive, although in some circumstances, caught birds are subsequently killed by other legal methods. In some cases, birds caught in live traps are relocated away from the original trapping site. Relocation to other areas following live capture would not generally be effective because

problem bird species are highly mobile and can easily return to damage sites from long distances; habitats in other areas are generally already occupied; and relocation would most likely result in bird damage problems at the new location. Relocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, difficulties in adapting to new locations or habitats, and the likelihood that relocated birds will become involved in damage situations at or near the release site.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps may be used by WS for corrective damage management and are effective in capturing local breeding and post breeding European starlings and other targeted secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976). Trapped birds are euthanized.

Mist nets are more commonly used for capturing small-sized birds such as English sparrows and finches, but can be used to capture larger birds such as ducks and ring-neck pheasants or even smaller hawks and owls. This method was introduced into the United States in the 1950's from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net, usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets are normally used for larger birds such as pigeons, feral ducks, and waterfowl and use mortar projectiles to propel a net up and over birds which have been baited to a particular site. This type of net is especially effective for waterfowl that are flightless during the molt and other birds which are typically shy to other types of capture.

Swedish goshawk traps are large cage type traps used for catching large birds of prey such as hawks and owls. These traps are two part traps with live bait (pigeons, rabbits, or starlings) placed in the lower section. The birds of prey are captured when they investigate the prey and perch on the trigger bar causing them to fall into the upper portions of the trap, which closes around the bird.

Bal-chatri traps are small traps used for capturing birds of prey such as hawks and owls. Live bait such as pigeons, starlings, rodents, etc. are used to lure raptors into landing on the trap (Hygnstrom and Craven 1994) where nylon nooses entangle their feet and hold the bird. The trap is made of chicken wire or other wire mesh material which is formed into a Quonset hut-shaped cage that holds the live bait. The outside top and sides are covered with many nooses consisting of strong monofilament line or stiff nylon string.

Bow nets are small circular net traps used for capturing birds. The nets are hinged and spring loaded so that when the trap is set it resembles a half moon. The net is set over a food source and it triggered by an observer using a pull cord.

Hand nets are used to catch birds in confined areas such as homes and businesses. These nets resemble fishing dip nets with the exception that they are larger and have long handles.

Net guns project a net over at target using a specialized gun.

Panel nets are most often used to capture birds that are unable to fly, such as waterfowl during molting periods. Panel nets as described by Costanzo et al. (1995) are lightweight, portable panels (4' x 8') that are

used to herd and surround geese into a moveable catch pen. This method is used to capture birds on a variety of surfaces, and can be employed in such a way as to reduce stress on captured birds (placement in the shade).

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle or the removal of completed nests that do not contain eggs. Nest destruction is generally applied when dealing with a small number of birds. This method is used to discourage birds from constructing nests in areas which may create nuisances and human safety problems for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective, but time-consuming method because problem bird species are generally abundant and highly mobile and can easily return to damage sites from long distances. The extent to which birds rebuild nests can be reduced by instructing homeowners to install physical barriers to discourage nest building. This method poses no imminent danger to pets or the public.

Egg addling/destruction is a method of suppressing reproduction in local bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times, causing detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen (see *Egg oiling* below). Egg addling and destruction is a valuable damage management tool and has proven effective in some applications.

Lure crops/alternate foods. When depredations cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area.

Relocation of damaging birds to other areas following live capture generally would not be effective nor cost-effective. Relocation to other areas following live capture would not generally be effective because problem bird species are mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and relocation would most likely result in bird damage problems at the new location. Relocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats. However, there may be exceptions for the relocation of damaging birds when the birds are considered to have high value such as raptors and T&E species. In these cases, WS would consult with the USFWS and/or NJDFW to coordinate capture, transportation, and selection of suitable relocation sites.

NON-LETHAL, CHEMICAL METHODS

Avitrol® is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely non-lethal in that a small portion of the birds are generally killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. This chemical is registered for use on pigeons, crows, gulls, blackbirds, starlings, and English sparrows in various situations. Avitrol® treated bait is placed in an area where the targeted birds are feeding. Usually, a few birds will consume the treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby frightening the remaining flock away.

Avitrol® is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. Avitrol® products are registered by the manufacturer, with the NJDEP PCP; a number of different products are registered, and only those registered at the time of the damage management work would be recommended or applied. It can be used anytime of the year, but is used most often during winter and spring. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol® is water soluble, but laboratory studies have demonstrated that Avitrol® is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol® may form covalent bonds with

humic materials, which may serve to reduce its availability for intake by organisms from water. It is non-accumulative in tissues and is rapidly metabolized by many species (Schafer 1991).

Avitrol® is acutely toxic to avian and mammalian species; however, blackbirds are more sensitive to the chemical and there is little evidence of chronic toxicity. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only magpies and crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that magpies exposed to two to 3.2 times the published Lethal Dose (LD_{50}) in contaminated prey for 20 days were not adversely affected and three American kestrels that were fed contaminated blackbirds for seven to 45 days were not adversely affected. Some hazards may occur to predatory species consuming unabsorbed chemical in the gastro-intestinal tract of affected or dead birds (Holler and Shafer 1982, Schafer 1981). A formal Risk Assessment found no probable risk is expected for pets and the public, based on low concentrations and low hazards quotient value for non-target indicator species tested on this compound (USDA 1997, Appendix P).

Methyl anthranilate (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. Methyl anthranilate (MA) (artificial grape flavoring food additive) has been shown to be a promising repellent for many bird species (Dolbeer et al. 1993). Cummings et al. (1995) found effectiveness of MA declined significantly after 7 days. Belant et al. (1996) found MA ineffective as a bird grazing repellent, even when applied at triple the recommended label rate. MA is also under investigation as a potential bird taste repellent. MA may become available for use as a livestock feed additive (Mason et al. 1984; Mason et al. 1989). It is registered for applications to turf or to surface water areas used by unwanted birds. The material has been shown to be nontoxic to bees ($LD_{50} > 25$ micrograms/bee[4]), nontoxic to rats in an inhalation study ($LC_{50} > 2.8$ mg/L[5]), and of relatively low toxicity to fish and other invertebrates. Methyl anthranilate is naturally occurring in concord grapes and in the blossoms of several species of flowers and is used as a food additive and perfume ingredient (Dolbeer et al. 1992; RJ Advantage, Inc. 1997). It has been listed as "Generally Recognized as Safe" (GRAS) by the FDA (Dolbeer et al. 1992).

Water surface and turf applications of MA are generally considered expensive. For example, the least intensive application rate required by label directions is 20 lbs. of product (8 lbs. active ingredient) per acre of surface water at a cost of about $64/lb., with retreatment required every 3-4 weeks (RJ Advantage, Inc. 1997). The cost of treating turf areas would be similar on a per acre basis. Also, MA completely degrades in about 3 days when applied to water (RJ Advantage, Inc. 1997), which indicates the repellent effect is short-lived.

Another potentially more cost-effective method of MA application is by use of a fog-producing machine (Vogt 1997). The fog drifts over the area to be treated and is irritating to the birds while being non-irritating to any humans that might be exposed. Fogging applications must generally be repeated 3-5 times after the initial treatment before the birds abandon a treatment site (Dr. P. Vogt, RJ Advantage, Inc., Pers. Comm. 1997). Applied at a rate of about .25 l./acre of water surface, the cost is considerably less than when using the turf or water treatment methods.

MA is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or the FDA.

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[4] An LD_{50} is the dosage in milligrams of material per kilogram of body weight, or, in this case in micrograms per individual bee, required to cause death in 50% of a test population of a species.

[5] An LC_{50} is the dosage in milligrams of material per liter of air required to cause death in 50% of a test population of a species through inhalation.

Particulate feed additives have been investigated for their bird-repellent characteristics. In pen trials, European starlings rejected grain to which charcoal particles were adhered (L. Clark, NWRC, Pers. Comm. 1999). If further research finds this method to be effective and economical in field application, it may become available as a bird repellent on livestock feed. Charcoal feed additives have been explored for use in reducing methane production in livestock and should have no adverse effects on livestock, on meat or milk production, or on human consumers of meat or dairy products (L. Clark, NWRC, Pers. Comm. 1999).

Other chemical repellents. A number of other chemicals have shown bird repellent capabilities. Anthraquinone, a naturally occurring chemical found in many plant species and in some invertebrates as a natural predator defense mechanism, has shown effectiveness in protecting rice seed from red-winged blackbirds and boat-tailed grackles (Avery et al. 1997). It has also shown effectiveness as a foraging repellent against Canada goose grazing on turf and as a seed repellent against brown-headed cowbirds (Dolbeer et al. 1998). Compounds extracted from common spices used in cooking and applied to perches in cage tests have been shown repellent characteristics against roosting European starlings (Clark 1997). Naphthalene (moth balls) was found to be ineffective in repelling European starlings (Dolbeer et al. 1988).

Tactile repellents. A number of tactile repellent products are on the market which reportedly deter birds from roosting on certain structural surfaces by presenting a tacky or sticky surface that the birds avoid. However, experimental data in support of this claim are sparse (Mason and Clark 1992). The repellency of tactile products is generally short-lived because dust tends to stick to the product. Additionally, tactile repellents may not be aesthetically pleasing and may require expensive clean-up costs as the material may run down the sides of buildings in hot weather. Commercial bird repellent products such as Tanglefoot Bird Repellent, "4 the Birds" Transparent Bird Repellent, Hot Foot Bird Repellent and Dr. T's Rabbit, Squirrel, Bat and Bird Repellent are registered (2003) by the NJBPC Program for bird control use in NJ. Prior to application, persons should check with the NJBPC to ensure that the product is registered at the intended time of use.

Alpha-chloralose is a central nervous system depressant used as an immobilizing agent to capture and remove pigeons, waterfowl and other birds. It is labor intensive and in some cases, may not be cost effective (Wright 1973, Feare et al. 1981). Alpha-chloralose is typically delivered as a well contained bait in small quantities with minimal hazards to pets and humans; single bread or corn baits are fed directly to the target birds. WS personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment. Alpha-chloralose was eliminated from more detailed analysis in USDA (1997) based on critical element screening; therefore, environmental fate properties of this compound were not rigorously assessed. However, the solubility and mobility are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about two to 30 times lower than the LD_{50}. Mammalian data indicate higher LD_{50} values than birds. Toxicity to aquatic organisms is unknown (Woronecki et al. 1990), but the compound is generally not soluble in water and, therefore, should remain unavailable to aquatic organisms. Factors supporting the determination of this low potential included the lack of exposure to pets, non-target species and the public, and the low toxicity of the active ingredient. Other supporting rationale for this determination included relatively low total annual use and a limited number of potential exposure pathways. The agent is currently approved for use by WS as an Investigative New Animal Drug by the FDA, rather than as a pesticide.

Egg oiling is a method for suppressing reproduction of birds by spraying a small quantity of food grade vegetable oil or mineral oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of the developing embryo. It has been found to be 96-100% effective in reducing hatchability. (Pochop 1998; Pochop et al.1998). The method has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not renest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. This method is extremely target specific and is less labor intensive than egg addling.

LETHAL, MECHANICAL METHODS

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large numbers of birds are present. In NJ, shooting of birds is done with a shotgun. Shooting is a very target-specific method. At times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. WS complies with all firearm safety precautions when conducting BDM activities and all laws and regulations governing the lawful use of firearms are strictly followed.

Firearm use may be a sensitive public concern because of issues relating to public safety. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Cervical dislocation is sometimes used to euthanize birds which are captured in live traps. The bird is stretched and the neck is hyperextended and dorsally twisted to separate the first cervical vertebrae from the skull. The AVMA approves this technique as a humane method of euthanasia and states that cervical dislocation, when properly executed, is a humane technique for euthanasia of poultry and other small birds (Beaver et al. 2001). Cervical dislocation is a technique that may induce rapid unconsciousness, does not chemically contaminate tissue, and is rapidly accomplished (Beaver et al. 2001).

Snap traps are modified rat snap traps used to remove individual woodpeckers, European starlings, and other cavity nesting birds. The trap treadle is baited with peanut butter or other food attractants and attached near the damage area. These traps pose no imminent danger to pets or the public and are usually located in positions inaccessible to people and most non-avian animals. They are very selective because they are usually set in the defended territory of the target birds.

LETHAL, CHEMICAL METHODS

All chemicals used by WS are registered as required by the FIFRA (administered by the EPA). WS personnel who use restricted-use chemical methods are certified as pesticide applicators/operators by NJ DEP Pesticide Control Program and are required to adhere to all certification requirements set forth in FIFRA and New Jersey pesticide control laws and regulations. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager.

CO_2 is sometimes used to euthanize birds which are captured in live traps. Live birds are placed in a container such as a plastic 5-gallon bucket or other chamber, and sealed shut. CO_2 gas is released into the chamber and birds quickly die after inhaling the gas. This method is approved as a euthanizing agent by the AVMA (Beaver et al. 2001). CO_2 gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO_2 by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

Starlicide® (3-chloro-p-toluidine hydrochloride) is a restricted use pesticide that is formulated as a 0.1% ready-to-use product and is commercially available to certified applicators or persons under their supervision. This avicide may be recommended or used by WS to control ravens, European starlings, crows, pigeons, cowbirds, grackles, magpies, and certain gull species. Starlicide® may be used in feedlots, around buildings and fenced non-crop areas, bird staging and roosting areas, federal and state wildlife refuges, and other sites (EPA 1995). Starlicide® is similar to DRC-1339 used in feedlots; however, it contains 0.1% DRC-1339 (USDA 1997, Appendix P). Therefore, the properties of this product are similar to DRC-1339 (discussed below).

DRC-1339 (3-chloro-p-toluidine hydrochloride) is the principal chemical method that would be used for bird damage management under the Proposed Action. DRC-1339 products are registered with the NJ DEP PCP by USDA APHIS WS in NJ. Nationwide, for more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving blackbird/starling problems at feedlots (West and Besser 1976, Glahn 1982, Glahn et al. 1987), dispersing crow roosts in urban/suburban areas (Boyd and Hall 1987), and Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban pigeon population reduction. Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice.

DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 has several EPA Registration Labels (56228-10, 56228-17, 56228-28, 56228-29, and 56228-30) depending on the application or species involved in the bird damage management project. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species, but only slightly toxic to non-sensitive birds, predatory birds, and mammals (Johnson et al. 1999, Schafer 1991, 1981). For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens, are highly sensitive to DRC-1339. Many other bird species such as raptors (Schafer 1981), sparrows, and eagles are classified as non-sensitive. Numerous studies show that DRC- 1339 poses minimal risk of primary poisoning to non-target and T&E species (USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits, except crows eating gut contents of pigeons (Kreps 1974). During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent (Johnson et al. 1999, Schafer 1991, 1984). DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

In NJ, WS has registered three DRC-1339 products with the NJDEP PCP: 1339 Gull Toxicant 98% Concentrate (EPA Registration No. 056228-17), Compound DRC-1339 98% Concentrate –Pigeons (No. 56228-28), and Compound DRC-1339 Concentrate-Feedlots (No. 56228-10). Label instructions are followed whenever WS uses pesticide products. Treated bait is placed such that target species have access, and so access by nontarget species is eliminated or significantly reduced. In NJ, WS's typical standard operating procedures used with DRC-1339 include, but are not limited to: 1. WS personnel remain on site while the pesticide is available to birds, 2. nontarget species are monitored and harassed away from the baited area whenever possible, and 3. unused bait is collected and properly stored or disposed of after conclusion of the field project.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment concluded that no adverse effects are expected from use of DRC-1339.

Appendix C. Federally Listed Threatened and Endangered Species in New Jersey

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An ENDANGERED species is any species that is in danger of extinction throughout all or a significant portion of its range.

A THREATENED species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	*Acipenser brevirostrum*	E
REPTILES	Bog turtle	*Clemmys muhlenbergii*	T
	Atlantic Ridley turtle*	*Lepidochelys kempii*	E
	Green turtle*	*Chelonia mydas*	T
	Hawksbill turtle*	*Eretmochelys imbricata*	E
	Leatherback turtle*	*Dermochelys coriacea*	E
	Loggerhead turtle*	*Caretta caretta*	T
BIRDS	Bald eagle	*Haliaeetus leucocephalus*	T
	Piping plover	*Charadrius melodus*	T
	Roseate tern	*Sterna dougallii dougallii*	E
MAMMALS	Eastern cougar	*Felis concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
	Blue whale*	*Balaenoptera musculus*	E
	Finback whale*	*Balaenoptera physalus*	E
	Humpback whale*	*Megaptera novaeangliae*	E
	Right whale*	*Balaena glacialis*	E
	Sei whale*	*Balaenoptera borealis*	E
	Sperm whale*	*Physeter macrocephalus*	E

	COMMON NAME	SCIENTIFIC NAME	STATUS
INVERTEBRATES	Dwarf wedgemussel	*Alasmidonta heterodon*	E
	Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	T
	Mitchell saytr butterfly	*Neonympha m. mitchellii*	E+
	American burying beetle	*Nicrophorus americanus*	E+
PLANTS	Small whorled pogonia	*Isotria medeoloides*	T
	Swamp pink	*Helonias bullata*	T
	Knieskern's beaked-rush	*Rhynchospora knieskernii*	T
	American chaffseed	*Schwalbea americana*	E
	Sensitive joint-vetch	*Aeschynomene virginica*	T
	Seabeach amaranth	*Amaranthus pumilus*	T

STATUS:			
E	endangered species	PE	proposed endangered
T	threatened species	PT	proposed threatened
+	presumed extirpated**		

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

** Current records indicate the species does not presently occur in New Jersey, although the species did occur in the State historically.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12.

For further information, please contact:

U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232
Phone: (609) 646-9310
Fax: (609) 646-0352

Revised 12/06/00

Appendix D. Correspondence from USFWS Regarding Federal T&E Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

In Reply Refer to:

ES-03/305

JUN 3 2003

Janet L. Bucknall, State Director
APHIS Wildlife Services
U.S. Department of Agriculture
140-C Locust Grove Road
Pittstown, New Jersey 08867

Dear Ms. Bucknall:

This responds to your May 1, 2003 request to the U.S. Fish and Wildlife Service (Service) for review of potential impacts to federally listed threatened and endangered and candidate species from implementation of the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services bird damage management program in New Jersey.

AUTHORITY

This response is provided pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. These comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comments by the Service as afforded by the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*), if project implementation requires a permit from the U.S. Army Corps of Engineers pursuant to the Clean Water Act of 1977 (33 U.S.C. 1344 *et seq.*); pursuant to the December 22, 1993 Memorandum of Agreement among the U.S. Environmental Protection Agency, New Jersey Department of Environmental Protection (NJDEP), and the Service, if project implementation requires a permit from the NJDEP pursuant to the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B *et seq.*); nor do they preclude comments on any forthcoming environmental documents pursuant to the National Environmental Policy Act of 1969 as amended (83 Stat. 852; 42 U.S.C. 4321 *et seq.*).

SERVICE CONCURRENCE

The Service has reviewed the USDA, APHIS bird damage management program and your analysis of potential impacts to federally listed and candidate species. The USDA bird damage

management program includes proposed conservation measures to avoid impacts to federally listed species when working in areas of known species occurrence. Additionally, although no adverse impacts to federally listed species are anticipated from program implementation, the USDA proposes to conduct individual consultation pursuant to the ESA with the Service for any project that may affect federally listed species.

Based upon a review of the information provided, the Service concurs with your determination of no effect for the dwarf wedgemussel (*Alasmidonta heterodon*), northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), gray wolf (*Canis lupus*), eastern cougar (*Felis concolor couguar*), Delmarva fox squirrel (*Sciurus niger cinereus*), Mitchell satyr butterfly (*Neonympha mitchellii*), American burying beetle (*Nicrophorus americanus*), bog asphodel (*Narthecium americanum*), and Hirsts' panic grass (*Panicum hirstii*) and your determination of not likely to adversely affect the bog turtle (*Clemmys muhlenbergii*), roseate tern (*Sterna dougallii dougallii*), Indiana bat (*Myotis sodalis*), piping plover (*Charadrius melodus*), bald eagle (*Haliaeetus leucocephalus*), swamp pink (*Helonias bullata*), Knieskern's beaked-rush (*Rhynchospora knieskernii*), small-whorled pogonia (*Isotria medeoloides*), American chaffseed (*Schwalbea americana*), sensitive joint-vetch (*Aeschynomene virginica*), and seabeach amaranth (*Amaranthus pumilus*). If additional information on listed and proposed species becomes available, or if project plans change, this determination may be reconsidered.

MARINE SPECIES

The Service provides the above determination with respect to federally listed threatened or endangered flora and fauna under Service jurisdiction only. Except for sea turtle nesting habitat, principal responsibility for threatened and endangered marine species, is vested with the National Marine Fisheries Services (NMFS). Of the federally listed sea turtles known to occur within New Jersey, only the loggerhead turtle (*Caretta caretta*) is known to occasionally nest within the State. The Service concurs with your determination of no effect to nesting habitat for the loggerhead turtle from the USDA, APHIS bird damage management program. To fulfill consultation requirements for marine species pursuant to Section 7(a)(2) of the ESA, the NMFS must be contacted at the following address:

National Marine Fisheries Service
Habitat and Protected Resources Division
Sandy Hook Laboratory
Highlands, New Jersey 07732
(732) 872-3023

Please contact Annette Scherer of my staff at (609) 646-9310, extension 34 if you have any questions or require further assistance regarding threatened or endangered species.

Sincerely,

John C. Staples
Assistant Supervisor

Appendix E. State Listed Threatened and Endangered Species in New Jersey

New Jersey Division of Fish and Wildlife

Endangered and Threatened Wildlife of New Jersey

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

Species names link to PDF documents containing identification, habitat, and status and conservation information. Use the Adobe Acrobat Reader to view and print these documents. The Reader is available free from Adobe's Web site.

BIRDS

Endangered		Threatened	
Bittern, American	*Botaurus lentiginosos* BR	Bobolink	*Dolichonyx oryzivorus* BR
Eagle, bald	*Haliaeetus leucocephalus* BR **	Eagle, bald	*Haliaeetus leucocephalus* NB **
Falcon, peregrine	*Falco peregrinus*	Hawk, Cooper's	*Accipiter cooperii*
Goshawk, northern	*Accipiter gentilis* BR	Hawk, red-shouldered	*Buteo lineatus* NB
Grebe, pied-billed	*Podilymbus podiceps**	Night-heron, black-crowned	*Nycticorax nycticorax* BR
Harrier, northern	*Circus cyaneus* BR	Night-heron, yellow-crowned	*Nyctanassa violaceus*
Hawk, red-shouldered	*Buteo lineatus* BR	Knot, red	*Calidris canutus* BR
Owl, short-eared	*Asio flammeus* BR	Osprey	*Pandion haliaetus* BR
Plover, piping	*Charadrius melodus***	Owl, barred	*Strix varia*
Sandpiper, upland	*Batramia longicauda*	Owl, long-eared	*Asio otus*
Shrike, loggerhead	*Lanius ludovicianus*	Rail, black	*Laterallus jamaicensis*
Skimmer, black	*Rynchops niger* BR	Skimmer, black	*Rynchops niger* NB
Sparrow, Henslow's	*Ammodramus henslowii*	Sparrow, grasshopper	*Ammodramus savannarum* BR
Sparrow, vesper	*Pooecetes gramineus* BR	Sparrow, Savannah	*Passerculus sandwichensis* BR
Tern, least	*Sterna antillarum*	Sparrow, vesper	*Pooecetes gramineus* NB

Tern, roseate	*Sterna dougallii***	Woodpecker, red-headed	*Melanerpes erythrocephalus*
Wren, sedge	*Cistothorus platensis*		

**Federally endangered or threatened

BR - Breeding population only; NB - non-breeding population only

REPTILES

Endangered		Threatened	
Rattlesnake, timber	*Crotalus h. horridus*	Snake, northern pine	*Pituophis m. melanoleucus*
Snake, corn	*Elaphe g. guttata*	Turtle, Atlantic green	*Chelonia mydas***
Turtle, bog	*Clemmys muhlenbergii***	Turtle, wood	*Clemmys insculpta*
Atlantic hawksbill	*Eretmochelys imbricata***		
Atlantic leatherback	*Dermochelys coriacea***		
Atlantic loggerhead	*Caretta caretta***		
Atlantic Ridley	*Lepidochelys kempi***		

**Federally endangered or threatened

AMPHIBIANS

Endangered		Threatened	
Salamander, blue-spotted	*Ambystoma laterale*	Salamander, eastern mud	*Pseudotriton montanus*
Salamander, eastern tiger	*Ambystoma tigrinum*	Salamander, long-tailed	*Eurycea longicauda*
Salamander, Tremblay's	*Ambystoma tremblayi*		
Treefrog, pine barrens	*Hyla andersonii*		
Treefrog, southern gray	*Hyla chrysocelis*		

INVERTEBRATES

Endangered		Threatened	
Beetle, American burying	*Nicrophorus mericanus***	Elfin, frosted (butterfly)	*Callophry*
Beetle, northeastern beach tiger	*Cincindela d. dorsalis***	Floater, triangle (mussel)	*Alasmido*
Copper, bronze	*Lycaena hyllus*	Fritillary, silver-bordered (butterfly)	*Bolaria se*
Floater, brook (mussel)	*Alasmidonta varicosa*	Lampmussel, eastern (mussel)	*Lampsilis*
Floater, green (mussel)	*Lasmigona subviridis*	Lampmussel, yellow (mussel)	*Lampsilis*
Mussel, dwarf wedge	*Alasmidonta heterodon***	Mucket, tidewater (mussel)	*Leptodea*
Satyr, Mitchell's (butterfly)	*Neonympha m. mitchellii***	Pondmussel, eastern (mussel)	*Ligumia n*
Skipper, arogos (butterfly)	*Atrytone arogos arogos*	White, checkered (butterfly)	*Pontia prc*
Skipper, Appalachian grizzled (butterfly)	*Pyrgus wyandot*		

**Federally endangered or threatened

MAMMALS

Endangered	
Bat, Indiana	*Myotis sodalis***
Bobcat	*Lynx rufus*
Whale, black right	*Balaena glacialis***
Whale, blue	*Balaenoptera musculus***
Whale, fin	*Balaenoptera physalus***
Whale, humpback	*Megaptera novaeangliae***
Whale, sei	*Balaenoptera borealis***
Whale,sperm	*Physeter macrocephalus***
Woodrat, Allegheny	*Neotoma floridana magister*

**Federally Endangered

FISH

Endangered	
Sturgeon, shortnose	*Acipenser brevirostrum***

**Federally Endangered

List updated 9/12/02

The lists of New Jersey's endangered and nongame wildlife species are maintained by the DEP's Division of Fish and Wildlife's Endangered and Nongame Species Program. These lists are used to determine protection and management actions necessary to ensure the survival of the state's endangered and nongame wildlife. This work is made possible through voluntary contributions received through Check-off donations to the Endangered Wildlife Conservation Fund on the New Jersey State Income Tax Form, the sale of Conserve Wildlife License Plates, and donations. For more information about the Endangered and Nongame Species Program or to report a sighting of endangered or threatened wildlife, contact the Endangered and Nongame Species, NJ Division of Fish and Wildlife, P.O. Box 400, Trenton, NJ 08625-0400, or call 609-292-9400.

Home NJ InTouch DEP HOME

Appendix F. Correspondence from NJDFW ENSP Regarding State-Listed T&E Species

James E. McGreevey
Governor

State of New Jersey
Department of Environmental Protection
Division of Fish and Wildlife
P.O. Box 400
Trenton, NJ 08625-0400
Martin J. McHugh, Director
(609) 292-9410, fax (609) 984-1414
Visit our Division Website: www.njfishandwildlife.com

Bradley M. Campbell
Commissioner

June 19, 2003

Janet L. Bucknall, State Director
APHIS Wildlife Services
U.S. Department of Agriculture
140-C Locust Grove Road
Pittstown, NJ 08867

Dear Ms. Bucknall:

This responds to your request to the Division of Fish and Wildlife – Endangered and Nongame Species Program (ENSP) for review of potential impacts to state listed endangered and threatened wildlife species from implementation of the Wildlife Services bird damage management program in New Jersey.

The New Jersey Division of Fish and Wildlife concurs that the proposed bird damage management program is not likely to adversely impact any state listed endangered or threatened species so long as the included control techniques are not directed specifically at any listed endangered or threatened wildlife species.

If the control program is to be applied to any state listed endangered or threatened species, our concurrence is subject to the following conditions:

- No control methods that involve trapping, handling or killing (including destruction of viable nests or eggs) directed specifically at any state listed endangered or threatened species can be employed without specific authorization within a DFW permit or written amendment to any existing permit.
- No control methods that involve significant habitat modification, hazing, or other forms of harassment can be directed against any state listed species without first notifying ENSP and receiving specific written authorization.
- Exclusion, barriers and cultural methods can be employed without restriction.

Thank you for the opportunity to review and provide comments on this environmental assessment. If you have any questions about our comments or wish to discuss specific wildlife damage / control situations with our staff, please feel free to contact us.

Sincerely,

C. David Jenkins, Jr.
Principal Zoologist
Endangered and Nongame Species Program

c. L. Niles
K. Clark
M. Valent